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Leading a Team Through Challenges: Resilience in Virtual Teams

Master's Thesis in Educational Psychology

FACULTY OF EDUCATION

Master's Programme in Education

2018

University of Oulu

Faculty of Education

Leading a team through challenges: resilience in virtual teams (Johanna Männistö & Nina Väisänen)

Master's thesis, 69 pages, 3 appendices

October, 2018

As the use of virtual teams in organizations is expected to only grow in the future, along with the continuous challenges in today's hectic and competitive business environment, the team's ability to withstand and overcome tough situations, in other words team resilience, becomes a crucial part of every team's success. This study was carried out as a qualitative case study and it aims to explore how different parts of resilience appear in the context of virtual teams from the leader's perspective, as well as the actions that occur by the virtual team leader in situations that require team resilience.

The participants of this study were nine virtual team leaders who use communication technology to coordinate teamwork and to collaborate with team members in a team where some or all of members work remotely and cannot collaborate in real-time or face-to-face all the time. The data was collected with web-based online questionnaire and the data analysis was made by using a qualitative theory-oriented content analysis.

The results of this study identified the parts of resilience that occur in virtual teams. Especially diversity and nonverbal communication had a lot of variation within teams of this study, but every team compensates the lack of nonverbal communication with other communication methods. Besides communication, trust and flexibility seem to be resilience-enhancing factors for almost every team.

The resilient practices were investigated in relation to Alliger's theory, and this study shows how communication is the most used tool in building virtual team resilience, and the usage of it succeed mostly in minimizing (before adversity) and mending (after adversity) phases. In ongoing adversity, communication reduces and causes stress for virtual teams. Besides communication, virtual teams use positive adaption and shared understanding to handle adversities, whereas cohesion and problem solving strategies were the least mentioned dimensions.

These results create an in-depth knowledge about a relatively new and unexplored topic. Instead of generalizing the findings, the aim is to objectively explore a smaller amount of virtual team leaders who gave insights about how virtual team resilience appears in their teams. By identifying the main enhancing factors related to virtual team resilience, the leader can improve these features and lead their team to success. The results are applicable for organization's management who use communication technologies to collaborate with team members and who seek to enhance virtual team resilience, as well as for organizations aiming to develop interaction and leadership models or educators working with e-learning.

Keywords: virtual team, team resilience, resilience, virtual team leader, virtual team resilience, communication

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1 INTRODUCTION

As technology advances, the use of virtual teams has become a vital part of organization's success (Horwitz, Bravington & Desmond, 2006) and the number of virtual teams is expected to only grow in the future (Dulebohn & Hoch, 2017; Maduka et al., 2018). Members of virtual team are not bound by time or location: they use the information and communication technology to work with each other in order to achieve the mutual goal (Ortiz de Guinea, Webster & Staples, 2012; Dulebohn & Hoch, 2017), enabling organizations to have a presence almost anywhere, and giving them the access to the best experts regardless of geographical location (Horwitz, Bravington & Desmond, 2006).

While providing a significant advantage to organizations in today's globalized economy, virtual teams also set unique challenges to their leaders (Bell & Kozlowski, 2002; Malhotra, Majchrzak & Rosen, 2007), such as building effective communication and trust between team members who may be spread across the globe (Snellman, 2013). Hence, the special focus should be addressed to development of best practices for virtual team leadership and virtual team effectiveness (Malhotra, Majchrzak & Rosen, 2007; Liao, 2017): conventional team leading skills tailored for teams who communicate mostly face-to-face are not sufficient to successfully lead the virtual team (Hambley, O'Neill & Kline, 2007) whose members lack the proximal face-to-face engagement (Bell & Kozlowski, 2002; Ryan, 2010).

As the use of teams (Lämsä & Hautala, 2004; Alliger et al., 2015) and virtual teams in organizations keeps increasing (Maduka et al, 2018), along with the challenges in today's competitive business environment, teams must face difficulties and setbacks and overcome them in order to survive (Dimas et al., 2018). This ability is called team resilience, which can be defined as a team's capacity to maintain performance under the crisis and bounce back, even strengthened than before, after the situation is over (Vera, Rodríguez-Sánchez & Salanova, 2017; Alliger et al., 2015). According to Alliger et al. (2015), resilience is an important feature for almost every kind of team from business teams to high-risk teams: they have, for example, studied team level quality in long-duration space mission teams in collaboration with NASA, where team resilience is a crucial part for a successful performance.

Research related to the role of leadership in enhancing team resilience is relatively new, the study of Dimas et al. (2018) being the first one to examine the subject. No previous study has

investigated this in the virtual team context and therefore, this study explores the appearance of team resilience in virtual teams, from the leader's point of view, as well as the actions that occur by the virtual team leader in situations that require team resilience. The study is carried out as a case study exploring virtual team leaders practices and experiences, targeting people who use communication technology to coordinate teamwork and to collaborate with their team members in a team where some or all of members work remotely and cannot collaborate in real-time or face to face all the time. The results will give important insights into how factors, which are seen to affect resilience, appear in practice in the context of virtual teams and also about the role of virtual team leader in enhancing team resilience.

2 THEORETICAL FRAMEWORK

2.1 Team and virtual team

The terms team and group are often referred to as the same thing, although they mean different things in the work context (Nilsson, 2005). The difference is that the team works collectively together, and each team members' expertise is important, whereas the workgroup consists more like sums of individual performances and it can be established without heavy justifications (Sudhakar, 2013; Hoch & Dulebohn, 2017). Hence, in order to be a team, there has to be a degree of interdependence between team members (Ryan, 2010).

Team has a clear common goal (Nilsson, 2005; Hoch & Dulebohn, 2017) and its members work together to achieve certain results or tasks (Berry, 2011). To accomplish their objects, work assignments are shared between team members based on their competencies – therefore every member's contribution and expertise are vital to the team's success and even one member's absence can affect the whole team (Nilsson, 2005; Hoch & Dulebohn, 2017). Although each team member has their own areas of responsibility, successful teamwork requires also common responsibility for the team's performance and results (Salminen, 2017), and commitment to achieve the common goal (Lämsä & Hautala, 2004).

The members of the successful team share a common understanding, which can also be called team cognition, and they know each other and their strengths and weaknesses through constant communication, which makes it easier to integrate the different skills of members and to find the most suitable tasks for everyone (Hoch & Dulebohn, 2017; Lämsä & Hautala, 2004). For the comfort of the team members, they should fit together by skills, commitment and group abilities, but they also have to develop a functional division of labour and show a good cohesion as a team (Nilsson, 2005).

Virtual teams can be defined as teams whose members are geographically dispersed and work interdependently sharing the responsibility of tasks, while using the information and communication technology as a main tool to collaborate with each other and to accomplish the common goal (Ortiz de Guinea, Webster & Staples, 2012; Dulebohn & Hoch, 2017). Technological advancements have changed the ways people communicate and turned the world, as Ryan (2010) describes, into a global neighborhood, enabling organizations to work without geographical constraints and across cultural and linguistic barriers (Joy-Matthews & Gladstone,

2000) as well as allowing employees to communicate with each other across the globe simultaneously and immediately without unnecessary delays (Ryan, 2010).

Rapid technological improvements and the accompanying changes in labour markets have led organizations to reform, for example by developing more flexible and adaptive ways of working and moving towards horizontal organizational structures and team-based work units (Hunsaker & Hunsaker, 2008). Research about virtual teams is relatively new, and we found that the oldest studies of virtual teams were from the end of 90's (e.g. Pliskin, N., 1997, "*The telecommuting paradox*" or Guss, C. L., 1998, "*Virtual project management: Tools and the trade*"). Virtual teams have become an essential part of many organizations enabling them to have a presence nearly everywhere, enhancing team diversity and new valuable perspectives, and in overall (Ryan, 2010), optimizing functions related to bringing employees and different skills together for a common task regardless of time and location (Martins, Gilson & Maynard, 2004). For example, today experts may be part of many teams simultaneously, without any travelling (Ryan, 2010).

As seen in the figure 1, the absence of proximal face-to-face engagement is the main difference between virtual and conventional teams (Bell & Kozlowski, 2002; Ryan, 2010), because members of virtual team may be located anywhere around the world (Davis, 2004). However, despite of this, working in a virtual team can be intensive (Lämsä & Hautala, 2004) and tasks and goals do not necessarily differ so much from those of face-to-face teams: it is a way of accomplishing work assignments through communication technologies and the challenges they face that are different from conventional teams (Bell & Kozlowski, 2002).

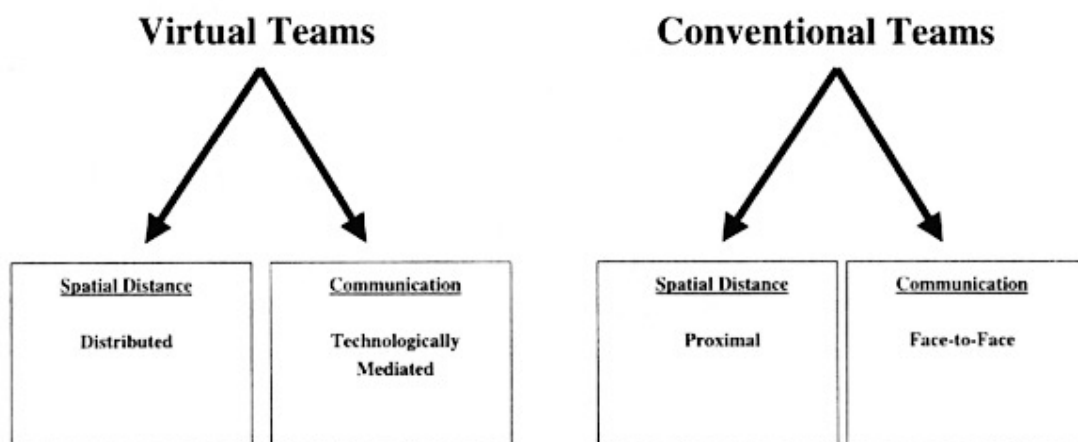


FIGURE 1. Characteristics that differentiate virtual teams from conventional teams (Bell & Kozlowski, 2002, p. 22)

According to Gazor (2012), virtual teams differ from conventional teams especially because of their complexity: communication, technology, trust, goal setting and leadership are the key elements of virtual teams, and their formation and practices differ from conventional settings. Proper communication and trust between team members are vital for team success (Gazor, 2012). In face-to-face communication, a significant part of the information is nonverbal (Gazor, 2012), but because of the spatial separation of virtual team members, special attention must be paid to the quality of interaction (Bell & Kozlowski, 2002). Morgan, Paucar-Caceres and Wright (2014) suggest that it doesn't matter what communication methods are used, but instead consistent and routine communication are ways to develop team's psychological traits such as trust, shared understanding and cooperation.

2.2 Resilience

As a term, resilience varies often in meaning, but in general it is understood as a capacity to positive adaption or maintaining mental health during adversities (Herrman, 2011; Mielenterveyden keskusliitto, 2018) and flexibility (Mielenterveyden keskusliitto, 2018). Juntunen (2014) describes individual resilience as a tolerance and recovering skill in crisis. According to Alliger et al. (2015), resilience constructs of 1) personal characteristics, such as optimism, cognitive flexibility, hardiness, realism and ability to cope with own fears, 2) individual's physical fitness, because being fit gives energy to endure longer and better cope with stress, 3) social support, because it's tough to cope alone through adversities. All factors mentioned cannot be enhanced in name of resilience, but it helps if factors in any part of psychological, physical or social area can be enhanced or developed (Alliger et al., 2015).

Resilience includes a thought about the fact that change is always going to happen and it's not possible to control, therefore it makes more sense to try to find ways to cope and withstand unexpected things (Siirtola, 2018). People experience at least one potential traumatic event in their lives, and it is called potential because the level of trauma in a certain situation can vary depending on the individual (Fletcher & Sarkar, 2013). Siirtola (2018) explains that communities that are diverse and have several backup plans are less vulnerable, because of their ability to switch actions as needed is smoother, and thus the collapse of one plan doesn't unsettle their overall functioning. The system can adapt to new situations and find new functional forms with resilience (Siirtola, 2018). Good resilience results to good survival and overcoming.

ing from crisis, therefore developing resilience results to better crisis management (Siirtola, 2018).

Resilience is a popular term in discussions of security, where it means the ability to prepare for and handle unexpected situations as well as the ability to live with uncertainties (Juntunen, 2014). Siirtola (2018) describes it as hardiness (see also Herrman et al., 2011), endurance, and tolerance in crisis situation. In ecological systems, resilience means recovering and adaptation dynamics, which include sustainable development (Juntunen, 2014). Psychological recovery skills (Suomen mielenterveysseura, 2018), cognitive flexibility, emotional regulation skills and resourcefulness help with survival from adversities (Herrman et al., 2011) so facing difficulties gets easier the next time (Mielenterveyden keskusliitto, 2018). Therefore survival is not the only thing that happens in resilient actions, it is more than just withstanding: it is about gaining skills and becoming better of handling future adversities (Suomen mielenterveysseura, 2018). To summarize, resilience is a capacity to face crisis - even if hardiness is a good thing (Herrman et al., 2011; Siirtola, 2018), it doesn't contain flexibility and the ability to transform (Siirtola, 2018). Hardiness is only about surviving; resilience is about winning the adversities (Siirtola, 2018).

Resilient people maintain their functions, construction and identity by adjustment so resilience shouldn't be studied only by finding enhancing or decreasing factors for resilience - the capacity for change should also be considered (Juntunen, 2014). For Juntunen (2014), resilience has a double meaning: 1) it describes the overall tendency to recover from adversity (resiliency, attention in emotional fortunes), and 2) it describes what are the individual's adjustment processes (resilience, attention in processes). Resilience is also not a birth given capacity without a connection to the social background (Juntunen, 2014). Characteristics, which may help dealing with adversities, are easy temperament, good self-esteem, planning skills, and supportive environment inside and outside the individual's family (Fletcher & Sarkar, 2013).

Herrman et al. (2011) say it is not quite clear if resilience is linked to personality traits or if it is a dynamic process. Fletcher and Sarkar (2013) point out that research about resilience should consist of the elements behind resilience, but that resilience as a process is also important to manifest. Resilience is a process, that individual goes through to win and overcome adversities (Fletcher & Sarkar, 2018). According to Herrman et al. (2011), some factors can enhance resilience in one situation, while some factors can affect in all life situations. He di-

vides the affecting factors into three categories: personality, biological and environmental-systematic factors. Personality traits like openness, extraversion, optimism, hardiness, agreeableness and adaptation skills refer to resilience. Biological factors can refer to events in early childhood that have formed the structure in the brain that can lead to different handling of negative situations. Supporting and sensitive environment for child's needs enhances interpersonal trust, and it reduces anxiety and cortisol levels in individuals, which in turn relates to better resilience. Environmental-systemic factors include also the thought of support from many relations, but also secure attachment to mother as well as family stability. In macro systemic level, good school, community services and the lack of exposure to violence are linked to resilience. The more there are risk factors, the more there should be protective factors (Herrman, 2011).

The criticism for resilience deals with the illegibility of the term and that the term is analytically unclear (Herrman, 2011). The construction of resilience is shiftily called to be either a trait, a process or an outcome (Fletcher & Sarkar, 2013). The meaning of the term "resilience" is unfortunately strongly simplified from being a balancing and controlling process during changes to new attitudes, which highlight the agility and independent skills during uncertainties, which would lead to flourishing of the individual (Juntunen, 2014).

2.2.1 Team resilience

Resilience develops over time when individuals gain skills that help with coping through adversities (Suomen mielenterveysseura, 2018). However, a group of resilient individuals does not automatically create a resilient team: the term can be approach both on the individual and the team level (Alliger et al., 2015), and as Vera et al. (2017) mention, it can also be studied as a quality of groups, communities or organizations. There are differences in views whether resilience is linked to a personality trait or if it is a dynamic process - it may be a personality trait that operates after a single short-term trauma (Herrman et al., 2011). Currently the latest research in organizational resilience sees resilience mostly as a dynamic capability with the ability of improvement (Vera et al., 2017). A system based on resilience is more able to tolerate strikes without collapsing of the whole system (Siirtola, 2018).

Alliger et al. (2015) define team resilience as a team's capacity to tolerate stressors and recover from them in a way that team maintains its ability to function. The degree of team resilience is visible only in challenging situations, and teams with a high degree of resilience also

demonstrate viability as well as the ability to face future challenges (Alliger et al., 2015). Team resilience, in other words team's psychic recovery (Suomen mielenterveysseura, 2018), constructs for example of good stress tolerance and willingness to survive, the recognition of own resources and the usage of them (Mielenterveyden keskusliitto, 2018), flexibility (Vera et al., 2017; Siirtola, 2018; Snellman, 2013; Herrman et al., 2011; Suomen mielenterveys liitto, 2018; Gazor, 2012; Juntunen, 2014), learning orientation and behaviors, positive relationships with team members and external networks, goal clarity, sense-making (Soon & Prabhakaran, 2018), psychological safety (Soon & Prabhakaran, 2018; Han et al., 2017), cooperation (Soon & Prabhakaran, 2018; Siirtola, 2018; Morgan et al., 2014; Työterveyslaitos, 2018; Gazor, 2012; Han et al., 2017), proper communication (Soon & Prabhakaran, 2018; Gazor, 2012; Maduka et al., 2018; Han et al., 2017; Morgan et al., 2014; Snellman, 2013; Nilsson, 2005; Herrman et al., 2011) and trust (Gazor, 2012; Soon & Prabhakaran, 2018; Snellman, 2013; Maduka et al., 2013; Han et al., 2017; Morgan et al., 2014; Snellman, 2013; Herrman et al., 2011). The resilient team has also diversity (Snellman, 2013; Siirtola, 2018; Snellman, 2013; Juntunen, 2014; Gazor, 2012) and a plan B (Siirtola, 2018; Juntunen, 2014).

Positive relationships with team members can be related with cohesion, which is also a crucial part of team resilience (Herrman, 2011; Maduka et al., 2018; Han et al., 2017; Morgan et al., 2014; Snellman, 2013). Also motivation (Gazor, 2012; Snellman, 2013; Nilsson, 2005), problem solving skills (Nilsson, 2005; Mielenterveyden keskusliitto, 2018; Työterveyslaitos, 2018; Suomen mielenterveysseura, 2018; Gazor 2012), long-term solutions (Gazor, 2012; Työterveyslaitos, 2018; Suomen mielenterveysseura, 2018; Nilsson 2005; Siirtola, 2018), self-regulation (Herrman et al., 2011; Suomen mielenterveysseura, 2018) and optimism (Mielenterveyden keskusliitto, 2018; Suomen mielenterveysseura, 2018; Herrman et al., 2011) are construction blocks for team resilience.

Soon and Prabhakaran (2018) summarize that team resilience is the team's capacity to positive adaption (see also Gazor, 2012; Herrman et al., 2011; Juntunen, 2014; Fletcher & Sarkar 2013), which is a psychological process and leads to higher innovation skills and enhances performance in challenging situations. To cope through challenges, the team has to build working methods together and communicate a lot in order to create a shared understanding (see also Gazor, 2012; Han et al., 2017; Snellman, 2013; Morgan et al., 2014; Nilsson, 2005), which helps a team to reach their goal (Soon & Prabhakaran, 2018). According to Vera et al. (2017), collective efficacy (believing in team's own capacity of completing a task), transformational leadership, teamwork (coherent team with same aims and norms) and good organi-

zational practices (e.g. leaders support their workers) are related with team flexibility and team resilience. Therefore, organization itself plays a vital role in creating team resilience (Vera et al., 2017).

Alliger et al. (2015) describe three behavioral strategies typical for resilient teams when dealing with stressors (see FIGURE 2 below): minimizing challenges before they occur, managing actions during challenging situation and mending after the challenge.

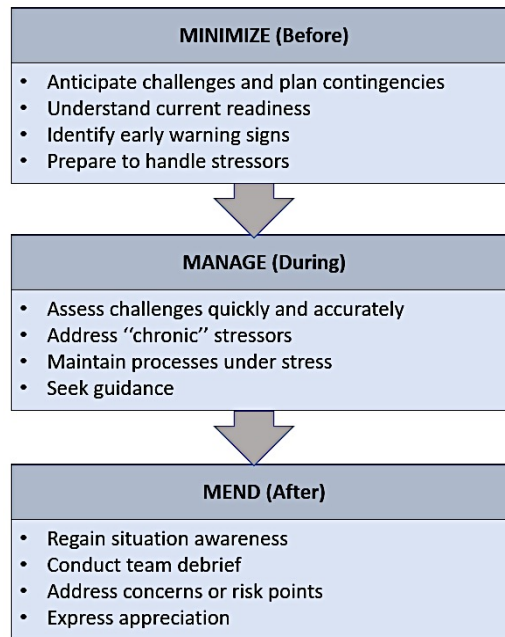


FIGURE 2. Behavioral strategies of resilient teams, based on Alliger et al. (2015, p.181)

According to Alliger et al. (2015), resilient teams tend to predict future challenges and prepare for them while assessing their readiness as well as the ways, how possible limitations might affect on achieving their goals. They manage challenging situations as they appear by assessing and addressing stressors and maintaining basic processes. They recognize if someone in a team is incapacitated, keep their communication channels active in case of need of support, and encourage to "easily approachable culture" meaning that members can ask advice from anyone in a team. Highly resilient teams also reach out easily to experts for guidance (Alliger et al., 2015).

The last phase of behavioral strategies collected by Alliger et al. (2015) is mending, which refers to recovering of the stressful situation, learning from it, and adapting if needed. The team creates an overall picture of the situation through effective communication, and during a team debrief members have the opportunity to share insights, handle what went well and what should still be developed and create action plans for the future (Alliger et al., 2015). Disturb-

ances and adversities work like hints about what to develop next - what are the factors that cause stress and how well is the team prepared for them? (Työterveyslaitos, 2018). The resilient team functions despite challenges, they learn from adversities and their performance improves after every stressful situation (Soon & Prabhakaran, 2018). They discuss about adversities and bring the details about failures and success into every member's knowledge (Työterveyslaitos, 2018; Alliger et al., 2015) and make the necessary changes (Alliger et al., 2015). The last thing members of the resilient team typically do is that they express appreciation after surviving the difficult situation (Alliger et al., 2015).

The most common problems in building team resilience are trust building and maintenance, distance and time issues, and collisions between different cultures (Snellman, 2013). Long-term solutions are resilient solutions, and they shall be discussed and developed by high degree of communication between every team member and their manager (Työterveyslaitos, 2018). According to Siirtola (2018), resilience is the ability to face crisis flexibly. Even if hardness is a good thing, it lacks flexibility and the adaption skills. Hardiness is about survival; resilience is about winning the adversities. With the help of flexibility, a system can adapt to new situations and find new functional forms (Siirtola, 2018).

Communication

Communication is vital for group identity, development of team norms, problem solving and making decisions (Nilsson, 2005). According to Morgan, Paucar-Caceres and Wright (2014), the less information is transformed via communication, the more decoding the receiver have to do. Face-to-face communication delivers a lot of information in short time because of non-verbal communication and voice tones, whereas communication via text delivers only very little hints about the sender. If the message contains a low amount of social hints, the quantity of delivered information has to increase (Morgan et al., 2014). Virtual communication often leads to decreased sharing of information, and it is less likely that team members draw their attention to a message received from a member who is geographically located elsewhere (Gazor, 2012). About 70 % of the shared information is nonverbal in face-to-face communication, and the biggest complaints in virtual teams arise from communication dysfunctions: the project visibility is foggy, there are difficulties in keeping contact, and technology has its limits as communication platforms (Gazor, 2012). Face-to-face communication includes a lot of hints, which leads to less information loss and it also includes the aspect of finding own social status (Snellman, 2013). Trust and cohesion are built by nonverbal communication like

behavior and facial expressions, which create a deeper and wider meaning for the message (Morgan et al., 2014). Morgan et al. (2014) suggest that face-to-face meeting is vital, even if happened only in the beginning of the project.

Technology offers teleworking, teleconferencing and video-conferencing, which help to communicate across time and space (Snellman, 2013). E-mail is the most popular form, but also videoconferences, groupware and project management programs are becoming increasingly popular (Gazor, 2012). Communication is important for success of the virtual team (Snellman, 2013). It is easier to overcome environmental uncertainties with the help of rich information (Gazor, 2012), and unfortunately for virtual teams, face-to-face communication is physically and cognitively less demanding than other forms of communication (Snellman, 2013). Team climate can suffer and team communication may not reach its full potential if team members never meet face-to-face (Nilsson, 2005). Team members have to practice on active and open communication even more than collocated teams, because technology causes limitations on communication richness (Gazor, 2012). If there is no possibility for nonverbal communication, members must raise communication quantity to compensate the lack of social hints (Morgan et al., 2014). Asynchronous communication causes delays in receiving the message, and the more ascetic communication (e.g. receiving an email) compared to richer forms of communication (e.g. video-conferencing), the more information drops off (Gazor, 2012; Nilsson, 2005). That's why open communication and rich information sharing are vital, and possible misunderstandings have to be recognized and fixed (Gazor, 2012).

It's not always easy to deliver the actual meaning of the message with virtual technology (Nilsson, 2005). According to Morgan et al. (2014), effective communication includes routine and consistent communication, and these are even more important than the communication methods itself. Communication is effective when its quantity and frequency are on a satisfying level, and the shared information is accurate (Snellman, 2013). Morgan et al. (2014) say that the routine of communication can be even more important than the methods of communication. A virtual team lacks of both routine communication and communication frequency, and the worst scenario is if the members assume that members understand each other and therefore leave vital information unshared, or that team members don't keep up the communication routine while the leader is away. Team members have to maintain interaction based on frameworks that the team leader sets up, so negotiation skills and rich discussions are vital (Morgan et al., 2014).

For Nilsson (2005), giving feedback is a process that ensures the understanding of each other in the same way. It includes reaction towards other team member's actions, it does not just mean giving feedback when it's asked for. Feedback can be informative (focuses on individual in a team, no concrete or goal directed evaluation needed) or formative and it should be transformed directly, provided in a way that the receiver listens and adapts it into future actions. Feedback should never be given aggressively (Nilsson, 2005). Morgan et al. (2014) highlight how important it is to dare to discuss more: the uneffectivity of a virtual team depends most likely on the lack of communication in certain circumstances. In other words, usage of electronic communication doesn't automatically result to weak team success (Morgan et al., 2014).

Trust

It is effective to count on other person's word because it saves time and efforts (Gazor, 2012). For high performance, a virtual team must build trust and respect which lead to engagement in innovative processes, and the management of team boundaries also gets easier (Morgan et al., 2014). In virtual teams, trust is even more important than in traditional, collocated teams - working is usually not synchronized in time and space so it's harder to follow what team members do (Snellman, 2013). Therefore it's better to aim at better trust than greater control in virtual team (Gazor, 2012). Trust is based on beliefs of togetherness and that everyone does what they are supposed to do (Snellman, 2013). Trust enhances via communication and information sharing (Snellman, 2013; Gazor, 2012; Morgan et al., 2014). Information sharing happens more unlikely if the complex ideas have to be written down or explained by phone, because communication is slower and gives less hints and therefore makes shared understanding harder to achieve (Gazor, 2012). Highest degree of trust begins with social messages, clear assessment of roles, with positivity and enthusiasm, and with a high degree of information in messages (Snellman, 2013). Trust is linked with cohesion, and cohesion is linked with motivation, but trust is also linked with team members' capacity to complete tasks (Snellman, 2013).

Cohesion

Cohesion means the high commitment of every team member (Ryan, 2010). Great commitment added to well shared understanding will lead to acceptance of more demanding roles when needed, and everyone in a team holds themselves accountable which again forecasts team success and greater cohesion (Ryan, 2010). When building relationships, trust is a key

factor in enhancing the quality of communication (Gazor, 2012). Communication doesn't only transform information, it builds social boundaries and trust (Morgan et al., 2014), and trust leads to better cohesion (Morgan et al., 2014; Snellman, 2013). Communication leads to better shared mental models that emerge in turn with better cohesion and involvement (Ryan, 2010).

Building and maintaining cohesion in teams that are used for a short time can be difficult, because trust doesn't develop quickly (Snellman, 2013). But when organizations switch over to long-term teams or special groups, the work quality, effectivity and satisfaction enhance, and absences decrease (Nilsson, 2005). High group cohesion leads to better motivation (Snellman, 2013), but motivating team members can be difficult because of the tendency to think virtual work as something temporary and easy (Nilsson, 2005). That's why it's important to start virtual teamwork with a face-to-face meeting even if it costs time and money - then it's easier to set concrete goals and rules, and get a "live" picture of the whole team (Nilsson, 2005). Face-to-face meetings increase trust (Morgan et al., 2014), which leads to better cohesion, which in turn is crucial in success of a virtual team's project (Snellman, 2013). Adversities that a team face can reduce cohesion significantly, so investments in cohesion lead to better maintain of resilience (Alliger et al., 2015).

Shared understanding

Shared understanding refers to reviewing issues together and deciding which alternatives to choose in a supportive interaction, which leads to effective decision-making (Snellman, 2013). Shared mental models are vital for team's success: an agreement of working methods and work tasks require that every team member understands and accepts the common practices (Ryan, 2010). Members of the virtual team have more difficulties in developing a shared understanding and shared group identity because of possible troubles in communication that virtual teams face more often than collocated teams (Gazor, 2012). Despite the actual meaning of the message, communication includes constant feedback that helps to create a shared understanding (Morgan et al., 2014). Psychological safety arises from respect towards others knowledge and skills, and the knowledge is shared and mistakes can be discussed without fear (Han et al., 2017). Shared understanding is important for a successful task completion (Snellman, 2013; Gazor, 2012; Morgan et al., 2014). Poor communication forces the receiver of the message to decode the actual meaning (Morgan et al., 2014), and especially complex information may be shared less via electronic technology or the elaboration of knowledge

might suffer (Gazor, 2012). Lack of shared understanding can lead to misunderstandings and miscommunication (Morgan et al., 2014). Also, the more an individual tries to convince his opinion and get the other one to think the same way, the more protesting it may cause from other individuals, even if this one individual's opinion is totally correct but aggressively disclosed (Nilsson, 2005).

A shared understanding develops usually from shared experiences, from same kind of backgrounds and norms, and also over time (Morgan et al., 2014). Brainstorming seems to work better in virtual groups because of a more anonymous feeling when communicating through electronic technology (Nilsson, 2005). Feeling of anonymity can, on the other hand, lead to more negative outcomes, and if this settles as a norm in a virtual team, it can be difficult to get rid of (Nilsson, 2005). If a team member doesn't feel free to join the conversation, it may lead to feelings of helplessness that decreases sharing of thoughts and knowledge (Han et al., 2017). Clarity of objectives help in creating strategies how to reach the goal, and the clarity helps to understand roles and tasks in team, which leads to more proper communication (Morgan et al., 2014).

According to Morgan et al. (2014), communication methods affect trust and shared understanding, which in turn lead to better effectivity, performance and viability of a virtual team. Viability is the team's capacity to collaborate, and it's highly affected by social skills and result-driven actions in a team (Morgan et al., 2014). It can be easy to "run away" from the virtual team because of the anonymous feeling, but if the amount of members is low and everyone is used to electronic communication, the risk is minimal (Nilsson, 2005).

Positive adaption

According to Fletcher and Starkar (2013), the definition of positive adaption is volatile, as well as adversity. That's actually one reason why the term "resilience" is sometimes questionable. It depends on the individual or the group, what adversities are and what are the positive adaptation processes that happen during an adversity (Fletcher & Starkar, 2013). Herrman et al. (2011) refers to positive adaption when describing resilience, which includes the maintenance of mental health during experienced adversity. Positive adaption constructs of intellectual functioning, cognitive flexibility, positive self-concept, emotional regulation, positive emotions and active coping (Herrman et al., 2011). Juntunen (2014) says it's important to strengthen the ways, which help a system to healthy adaptation. Adaptation can be enhanced by improving the system's ability to resist the passivating effect of crisis (Juntunen, 2014) and

by gaining and constructing constantly new knowledge (Siklander & Impiö, 2018). According to Seligman (2008), the inability to affect on what happens can lead to passivation. Positive interpretation, which helps in preventing passivation, includes optimism and capacity to see adversities as temporary events (Seligman, 2008).

According to Herrman et al. (2011), it is important to look at the system dynamics, for example everything from societies to culture, when trying to find what could be positive adaptation. This refers to the cumulative transform sensitivity (Herrman et al., 2011). There are so many aspects affecting the positive adaptation system, that it is vital to see the whole picture and handle the cumulative parts affecting individuals, and to the whole system (Juntunen, 2014). What is then counted as a positive adaptation? It varies a lot, but for example in school environment it can be learning whereas in soldier life that one doesn't suffer from mental illness (Fletcher & Sarkar, 2013). Positive adaptation depends on the sociocultural context, where an individual operates in (Fletcher & Sarkar, 2013).

Diversity

Sensitivity for changes in environment is dependent on genetic factors (Suomen mielenterveysseura, 2018). The way we act and feel in our lives, depends on how we are raised and also of some biological factors (Suomen mielenterveysseura, 2018). As an example, a warm and caring mother can enhance both self-esteem and self-confidence, which lead to good social interaction skills, and all these factors enhance resilience cumulatively (Herrman et al., 2011). People have different values and statuses, national culture, geographic location, and different communication practices, which all create diversity in teams (Snellman, 2013). Age, sex, gender, race and ethnicity bring also diversity into teams and to their resilience by affecting for example social relationships and population characteristics (Herrman et al., 2011). Also, cultural diversity affects the approach towards a conflict (Nilsson, 2005).

Individual experiences and things that happen in our environment (both positive and negative) constantly form our resilience (Suomen mielenterveysseura, 2018). Resilience construct of multiple affecting factors because individuals have different history, and the more there is geographical distance and differences in local behavioral norms, the more variable there are for example in problem definition and solving skills (Gazor, 2012). Age, genus, clothing and ethnicity are examples of what individuals use to find their own status in groups - if members don't see each other, finding own status may be difficult (Nilsson, 2005). In virtual teams,

own status must be found in other ways than in conventional teams, for example by showing great competence or discussing actively (Nilsson, 2005).

There are not only challenges in team diversity. Ecosystem's resilience constructs of transformable and agile parts that affect resilience cumulatively (Juntunen, 2014). The more complex the system is, the more flexible and transformative it is which are also linked with positive adaption (Juntunen, 2014). A successful recovery from adversities needs developed actions where skills, knowledge, trust, or social relationships are on a better level (Herrman et al., 2011), and it can be seen that diversity enhances creativity (Han et al., 2017), knowledge, skills, and in best situations trust and social relationships (Juntunen, 2014).

Flexibility

Working boundaries have at least in some parts disappeared, and flexible working arrangements have become more common (Snellman, 2013). Cognitive flexibility is associated with resilience (Herrman et al., 2011), and it is vital to attain new skills and be able to change traits, attitudes and behavior for success of the organization (Snellman, 2013). The resilient skills develop with time and experience gained in coping with adversities, and one of these is flexibility (Suomen mielenterveysseura, 2018). Resilient teams are flexible, and flexibility builds according to Vera et al. (2017) of good *team resources* (collective efficacy, transformational leadership and teamwork) and good *organizational resources* (facilitating communication, career development and work-family balance).

According to Siirtola (2018), having multiple choices or *plan B*:s help with coping in a constant changing world - teams must be ready to change their plans if necessary. It's hard to forecast what changes or adversities might happen in the future, but the better the team knows their area, the easier it is to imagine what might happen and then prepare for it. All the five dimensions of resilience (political, economical, technical, social and organizational) enhance flexibility in case of crisis (Siirtola, 2018), and also complex systems (diversity) are more flexible because of its many parts that can take over if needed (Juntunen, 2014).

It's good to discuss with team members in advance about how to cope with overcrowding or problematic situations (Mielenterveyden keskusliitto, 2018). Resilience increases when problems are analyzed and solved together between every team member, and plan B:s are made (Siirtola, 2018; Työterveyslaitos, 2018) as well as *long-term plans* are created instead of short-term solutions (Työterveyslaitos, 2018). Diverse systems are less vulnerable (Siirtola, 2018). Questions that can be asked when planning long-term solutions: where did the problem

occur? What is the new idea linked with? How is it related to working processes, tools, cooperation or assignments? Does the solution delete problems permanently, or is it possible to develop an even better way to prepare for possible adversities? (Työterveyslaitos, 2018). Teams must have alternative plans for being able to flexibly change direction if needed; the world is constantly changing and it's impossible to forecast exactly what will happen, therefore a plan B is important to have (Siirtola, 2018).

Problem solving

Communication is important for group identity, development of group norms (Nilsson, 2005), and for problem solving (Mielenterveyden keskusliitto, 2018; Nilsson, 2005). The more there are geographical distance and differences in cultures, the more the problem defining and solving process can differ (Gazor, 2012). The most common problem for a team and its leader is to solve how to build and maintain trust between diverse members, despite distance and possible time-issues (Snellman, 2013). Virtual groups are good at brainstorming and creating ideas, but on the other hand they may be too careful with making decisions - the risk is that the team never takes proper responsibility for decisions (Nilsson, 2005). Good cohesion results in good problem solving because team members interact more with each other than in less coherent teams (Brewer, 2010). Brewer (2010) also points out, that a collaborating team needs administrative support from someone who gives visions, as well as training and support. Keeping time is hard in work which requires a lot of thinking, so time frames help teams to work effectively. Furthermore, accountability is vital for problem solving teams - members must report about implementations or outcomes to each other to keep themselves up to date (Brewer, 2010). Task-related and problem solving diversity refers to "knowledge, skills, abilities, beliefs, values, perspectives and performance strategies" in special tasks, which may mean different ways to solve problems or ability to solve various problems together (Larson Jr., 2007).

Recovery

Besides referring to positive adaption, resilience is an ability to maintain mental health even in adversity (Herrman et al., 2011), and an ability to maintain or restore mental health during a tough situation (Soon & Prabhakaran, 2018). A team's transform sensitivity, which is a part of recovering can be enhanced by strengthening the system's ability to resist the passivating effect of crisis (Juntunen, 2014). Support or task division can prevent the passivating effect and if possible, the responsibility can temporarily be reduced from single individuals (Falk-

heimer & Heide, 2008). A system's resilience builds partly on adaptation skills and flexibility (Juntunen, 2014). The more diverse the system is, the more flexible and capable for change its members are - this leads to a thought of diversity being a resilience-enhancing resource (Juntunen, 2014). Hope and optimism are vital for recovery (Newman, 2014).

Optimism

Surviving skill is linked with optimism, which refers to the capacity to handle negative feelings during adversities, to see the positive sides even in negative outcomes, and to recognize own possibilities to influence (Mielenterveyden keskusliitto, 2018). Personality traits as openness and agreeableness help with maintaining a positive attitude (Herrman et al., 2011), and optimism is central in recovering and maintaining mental health (Newman, 2014; Lamers, 2012). But to be noted, too much optimism can lead to negative consequences, whereas a more negative attitude might in some cases lead to enhanced performance (Norem & Chang, 2002), which should be considered when building optimism.

2.2.2 Situations requiring resilience

Nilsson (2005) describes the conflict, for example, as a collision between opinions, expectations, demands, evaluation, goals, wants, habits, views, personality, expression of feelings, or roles. Adversity is integrated in everyday life: everyday job stress causes mild level of adversity, whereas a loss of a close person causes extremely high levels of stress, which can be called, in other words, for strong adversity (Fletcher & Sarkar, 2013). For a team, typical resilience requiring challenges are, for example, unclear team roles or time pressure, as seen in the figure 3 below (Alliger, et al., 2015).

Table 1 Some Common Team Challenges That Require Resilience.

<ul style="list-style-type: none"> • Difficult assignments • Time pressure • Insufficient resources • Conflict with people outside the team • High consequence work (e.g., safety, critical planning) • Challenging conditions (e.g., noise, lighting, proximity to others) 	<ul style="list-style-type: none"> • Hazardous work • Angry/upset customers • Interpersonal conflicts within team • Lack of control • "Missing" team members (e.g., vacation, ill) • Inadequate work output by one or more team members • Poor results 	<ul style="list-style-type: none"> • "Crisis" events • Constant pressure, even if low-level (e.g., work is never complete) • Changes in team membership • Unclear team roles • Ambiguity of direction/goals • Multiple simultaneous smaller challenges
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FIGURE 3. Typical challenges that require team resilience (Alliger et al., 2015, p. 177)

Alliger et al. (2015) categorize team challenges into chronic or acute, where chronic challenges are harder to identify and remove. Chronic challenges are not intense, but lay constantly in the background disturbing in some way. This could be, for example, a constant pressure at work or ambiguity of goals (Alliger et al., 2015). A less spoken subject is, that also positive events can be linked with resilience if those cause stress or are otherwise hectic situations (Fletcher & Sarkar, 2013).)

Nilsson (2005) describes that feelings like anger, aggression, giving up, or despair are common in crisis. Fight or flight reactions, refusal or different explanations are also common ways to react during adversities (Nilsson, 2005). Team members can also become more selfish and take care of their own interest - this is where decision-making, coordination and performance reduces dramatically (Alliger et al., 2015). Siirtola (2018) says that it's important to find ways to adjust under changes whether we want or not. This kind of plasticity during changes has to be based on versatility and regeneration skills. Resilience includes a thought about how change is unstoppable, and that's why it's reasonable to find ways to tolerate and overcome unexpected situations (Siirtola, 2018). Nilsson (2005) describes how even the most harmonic teams can undergo a crisis. Positive effects of conflicts are that comfort reduces (this causes enhanced effectivity), structures change, the climate becomes more open and norms become clearer. Other positive effects of crisis are better goal definition, new ideas and stimulance of team's creativity, while negative effects include strong negative emotions, stress, weakened communication, loss of direction, a threat against cohesion, bad decisions (or no decisions at all) and a winner-loser approach (Nilsson, 2005).

Many conflict situations are resolved with routine, while other conflicts create tension between individuals: it's important to see if the conflict arises from outside or inside the team, or from one team member (if so, scapegoating should be avoided) (Nilsson, 2005). Siirtola (2018) describes five dimensions of resilience in crisis management: political (ability to make good decisions under pressure and push them forward even if the solutions are not liked), technical (backup systems, resources and accessories), organizational (functions decentralized, backup plans), social (alternative models for service production) and economic (diversity, everything doesn't rely on one card). All these five dimensions of resilience create flexibility and shockproofness: for example a society that is able to adaption and is resilient, has better tolerance and capacity to overcome crisis situations (Siirtola, 2018). There are many different kinds of conflict situations (Nilsson, 2005), but because resilience is needed in any kind of unexpected situations (see e.g. Juntunen, 2014), the forms of crisis are not deeper analyzed.

Good resilience leads to greater ability to overcome crisis, therefore development of resilience results in better crisis management (Siirtola, 2018).

2.3 Leading a virtual team

As the significance of teamwork increases in organizations, the focus has shifted to the role of leadership in the success of teamwork, and the leadership style has changed to a more team-oriented approach instead of managing only individuals (Morgeson, DeRue & Karam, 2010; Kozlowski & Bell, 2003). For example, according to Offerman and Spiros (2001), managers spent almost 40 percent of their time working with teams and groups. In addition to this, technological advances along with the increased use of virtual teams have led to the question of how to lead a virtual team effectively (Liao, 2017).

According to Malhotra, Majchrzak & Rosen (2007), it is necessary to change work and leadership practices as companies become virtual and move towards the implementation of virtual teams. Effective leadership of virtual teams is vital for building successful organizations in globalized economy (Maduka, Edwards, Greenwood, Osborne & Badatunde, 2018). Because of the differences between virtual and traditional teams, it is not sufficient for leaders to lead the virtual team the same way than the face-to-face team (Hambley, O'Neill & Kline, 2007). For example, Iorio and Taylor (2014) suggest that when selecting candidates for leadership positions of virtual teams, good predictors for successful performance of the role are prior experience working in virtual teams, especially with the supporting technologies. Selection cannot be based only on the completed leadership training which focuses on traditional work structures or at least, candidates should be provided the opportunity to familiarize them with virtual team work before the actual assignment (Iorio & Taylor, 2014).

Although virtual teams offer many benefits, they also present unique challenges to leadership (Bell & Kozlowski, 2002; Malhotra, Majchrzak & Rosen, 2007). As described above, two main characteristics of virtual team, the spatial distance and technologically mediated communication create challenges for leaders to track performance management of team members and to perform typical team development functions (Bell & Kozlowski, 2002). In short, everything from coordinating within teams to managing conflicts requires special attention in virtual team settings (Liao, 2017).

New challenges arise like combining global experts, stakeholders, and organizations (Snellman, 2013). Also, Nilsson (2005) suggests that an organization's culture should not counteract team's goals. Virtual teams tend to have challenges in trust, deadline, cohesion (Gazor, 2012) and communication (Gazor, 2012; Snellman, 2013; Morgan et al., 2014). Lack of physical, face-to-face and social interaction lead to reduced trust and cohesion (Gazor, 2012; Snellman, 2013), as well as the lack of project visibility, individual regard and celebration after accomplishing a task (Gazor, 2012). Challenges in communication are caused by difficulties in coordinating asynchronous and synchronous communication (Snellman, 2013), the lack of both routine and communication frequency and assuming that shared understanding occurs (Morgan et al., 2014). Creating a shared understanding with the lack of information is challenging (Morgan et al., 2014). If a virtual team leader doesn't reach every team member with current information, it may lead to situations where team members do a lot without focusing on the right task (Morgan et al., 2014). Ineffective working processes, difficulties with technology, and the lack of spontaneous communication lead to dispersed outcomes (Gazor, 2012).

One of the characteristics for a successful leader in a virtual environment is effective communication, containing constant feedback, clear instructions and a direction, so that team members know team's objectives and that their input is a vital part of the outcome (Maduka et al., 2018). The virtual team leader has to recognize the invisible dimensions of a culture, such as beliefs, values and attitudes, and also the visible parts of the culture: communication style, ways to respond or react in front of a conflict, and different decision-making styles (Gazor, 2012). Also, the ability to build trust, team orientation and team integration, conflict resolution skills and technology skills, among other things, are crucial competencies for the virtual team leader (Maduka et al., 2018). Snellman (2013) sees networking skills, a global cultural mindset, knowledge leading, and sensitivity towards workers as the most crucial for virtual team leader. The leader must also constantly find new tools to facilitate virtual working, so that distance working becomes easier (Alliger et al., 2015). Morgan et al. (2014) noted that negotiation skills and a rich usage of communication are the most important factors that lead to positive effects of virtual team leading. Snellman (2013) says leaders, who can convert challenges into opportunities by actively gaining new skills and choosing the right technological platforms for a specific task, have the best prerequisite for enhancing virtual team resilience.

2.3.1 Leader's role in team resilience

Resilient teams can withstand and overcome adversities, in a way that viability remains (Alliger et al., 2015). Team resilience affects team effectiveness (Dimas et al., 2018), and luckily all teams can enhance resilience (Alliger et al., 2015; Vera et al., 2017; Snellman, 2013; Soon & Prabhakaran, 2018; Gazor, 2012; Nilsson, 2005; Morgan et al., 2014; Han et al., 2017) for example by developing behaviors that facilitate minimizing, managing and mending (Alliger et al., 2015), by managing communication (Gazor, 2012), or by building cohesion (Snellman, 2013). Team and organizational resources are also linked with team resilience (Vera et al., 2017). The differences between managing a conventional team and a virtual team cause changes in management organizing - new skills, traits, attitudes and behavior must be shown to ensure the success of the organization (Snellman, 2013). These differences and actions will be discussed through this chapter.

Working boundaries are blurred with less hierarchy than before (Snellman, 2013). A virtual team leader might never see its team members in real life and he/she might have to work from same place but in different times (Snellman, 2013), but when managing communication, the team's poor effectiveness might not depend on the form of communication (whether it is via email, telephone or Skype), but rather the lack of communication when considering the situation, and the lack of communication routine (Morgan et al., 2014).

Leaders lead by example (Dimas et al., 2018), but to help team resilience to enhance, some other actions can be made. According to Vera et al. (2017), managing interventions shall take place to get better collective efficacy. Also good organizational practices, like work-family balance, and teamwork training promote team resilience. The leader's role is to offer direction and structure (Soon & Prabhakaran, 2018; Gazor, 2012), ensure a safe environment and learning (Soon & Prabhakaran, 2018), and to manage equal communication (Soon & Prabhakaran, 2018; Alliger et al., 2015; Gazor, 2012; Maduka et al., 2018; Nilsson, 2005; Morgan et al., 2014; Snellman, 2013; Diman et al., 2018; Vera et al., 2017). Gazor (2012) sees, that leaders have two primary functions in virtual teams: leading performance and team development. This means that the leader must construct a self-directed team in a constantly changing environment (Gazor, 2012). Virtual team leaders must be precise in work instructions, feedback and training (Snellman, 2013). They take responsibility in building the long-term commitment, which leads to solidarity and cohesion between team members (Gazor, 2012). For everyone's comfort, the leader divides resources, comes up with good situational strategies and

makes sure everyone takes responsibility for achievements and group climate (Nilsson, 2005). Leadership is also about affecting others behaviors and attitudes, and it is a skill to conduct other's behavior and character (Maduka et al., 2018). Prioritizing the use of time leads to more effectiveness and better outcome (Morgan et al., 2014).

Alliger et al. (2015) have created a great list of concrete actions what leaders can do to build team resilience. *First*, a leader can provide tools and documents such as 1) step-by-step checklists 2) guidelines for problems 3) standard operating procedures (SOPs) which help to proceed with standard actions as well as simultaneously cope with problems 4) resource matrices with contacts of experts who can be reached when needed. *Second*, a leader can conduct training by arranging team resilience discussions where team members complete a physical task (either very realistic or less realistic) or perform cognitive "think-out-loud" procedures where every step of action and problem solving are explained. Besides individual learning, discussions in both physical and cognitive training help to create a shared understanding. *Third*, a leader can conduct post-challenge debriefs. It is based on the idea that resilience appears only during real adversities, therefore adversities should be discussed and analyzed directly afterwards by describing the minimizing (before), manage (during) and mend (after) strategies in adversity. Questions like how did we proceed and what could be done differently are discussed through in debriefs. *Fourth*, a leader can influence the team resilience culture by rich and truthful communication, pointing out potential problems, remaining calm under pressure, and by taking care of team members' needs and development both in everyday work and in possible emergencies (Alliger et al., 2015).

There are also other concrete ways to enhance team resilience as a team leader. Besides rich and truthful communication (Alliger et al., 2015; Morgan et al., 2014; Gazor, 2012), a leader must guide not only what and when, but how to communicate (Gazor, 2012). Also communication frequency (Morgan et al., 2014; Snellman, 2013) and routine are important to take into account (Morgan et al., 2014). It is seen, that providing the chance to meet face-to-face may enhance resilience, but if this is not possible, at least videoconferences or voice communication should take place (Gazor, 2012). Especially during a crisis, face-to-face meetings or videoconferences are the best ways to cope through the challenging situation (Gazor, 2012). The only way to solve conflicts is to talk about them, even if it feels very uncomfortable, and it's not enough to talk - it's vital to discuss about the real problems (Nilsson, 2005). Attitudes, feelings, thoughts and behaviors must be delivered through technology in virtual teams, and this may be difficult without praxis in communicating through electronic platforms (Snell-

man, 2013). A good technology itself doesn't ensure the quality communication, a leader must also build a mental tool for members' communication - for example, some members may hold information for themselves, and this is when a leader should encourage them to share information until shared understanding is reached (Gazor, 2012). According to Snellman (2013), trust building enhances cohesion, which enhances motivation. Trust can be enhanced by diminishing uncertainty, setting expectations, creating positive climate and arranging situations for open discussion and creating shared understanding (Snellman, 2013). Gazor (2012) suggests five ways to enhance trust: 1) arrange some face-to-face meetings 2) set goals and expectations 3) give constant feedback 4) give attention to competencies and 5) ensure a shared understanding happens despite the cultural diversity (Gazor, 2012).

Transformational leadership style is seen as a promoting factor for team resilience (Dimas et al., 2018; Vera et al., 2017). According to Xie et al. (2018), leadership style can be defined as a constant behavioral model and trait that appears in the behavior of leaders. Previous studies about the impact of leadership style on virtual team's success support the view that transformational leaders have greater chance to lead their team into success compared to transactional leaders (Maduka et al., 2018; Gazor, 2012). Leaders with the transactional leadership style focus on task performance and measuring the performance of their employees, leaving little attention to work atmosphere creation or interaction (Bhat et al., 2012), which is not very efficient leadership style in virtual team settings (Maduka et al., 2018). Compared to this, transformational leaders pay attention to the individual needs of team members and encourage them to new ways of thinking (Bhat et al., 2012).

Leaders cannot be experts in everything: instead, they must act as experts who encourage others to achieve their full potential (Kozlowski & Ilgen, 2006). They work as inspirational role models: they develop a strategic vision and communicate it in a way that motivates their team members to achieve the vision of organization and see the vision as their own (Bhat et al., 2012; Gazor, 2012; Nilsson, 2005). They are self-reflective (Maduka et al., 2018), have courage to make decisions, stand behind them, and also change the decision if something does not work (Nilsson, 2005). Transformational leaders trust their employees to achieve their goals (Bhat et al., 2012) and give them feedback (Nilsson, 2005).

Giving feedback and support, as well as maintaining behaviors that enhance confidence, cohesion and ability to face adversities within team, are all included in transformational leadership (Vera et al., 2017). These behaviors enhance team resilience, which leads to greater lev-

els of team viability (Dimas et al., 2018). Viability is the team's capability to collaborate: the level of how "healthy" a team is (Morgan et al., 2014). With a great leadership, involving problem solving with resourcefulness and ingeniousness, team members have high commitment and the whole team becomes coherent (Gazor, 2012). Therefore a leader must have good social and networking skills, sensitivity in reacting to team members minds, and a great willingness to full time-orientation (Snellman, 2013).

Han et al. (2017) investigated that shared leadership was a key element for a well performing virtual team, suggesting that shared leadership helps everyone's voice to be heard which increases the creativity, leading to better output and therefore better cohesion. Hoch and Dulebohn (2017) defined shared leadership as a collective within-team process, involving multiple individuals who participate in leadership functions, which in turn increases team members' mental motivation as well as commitment to the team. Also, Day, Gronn and Salas (2004) see leadership as a team's feature, which develops through team members' individual skills and team processes such as teamwork, team learning and shared leadership. This kind of leadership capacity increases team's resilience and helps it to survive from challenging situations (Day, Gronn & Salas, 2004).

3 RESEARCH METHODS

3.1 Aim and research questions

This study aimed to contribute to a deeper understanding about team resilience in the context of virtual teams as well as the role of virtual team leader in enhancing team resilience, which is a vital capacity for teams to have in order to cope with continuous challenges. The focus was on exploring how different parts of resilience appear in virtual teams, from the leader's perspective, and what actions a virtual team leader is practicing in adversities that require team resilience. The aim of this study is to explore these factors by asking resilience-related questions about team's composition, leader's practices of working with a virtual team as well as about actions before, during and after team resilience-requiring situations.

Our research questions are as follows:

1. How factors, which affect team resilience, appear in practice in the context of virtual teams?
2. What actions appear by the virtual team leader in situations requiring team resilience?

3.2 Participants and data

The participants in this study were team leaders (N=9), leading a virtual team. The criteria for a virtual team was based on a suggestion of Schweitzer & Duxbury (2010) that a team is considered to be virtual, if some or all team members work remotely and cannot collaborate either in real time or face-to-face all the time, and they have to use communication technology in order to work. Also, participants from all kind of industries were accepted. Research participants were selected by combining both purposeful sampling and criterion sampling: we selected individuals for the study with the idea that they have experience in leading a virtual team and can offer important insights and ensured that all participants met our criteria for a virtual team leader (Creswell, 2013). To find participants, we started by mapping out our networks and used also LinkedIn as a research tool for finding potential candidates. We contacted directly to virtual team leaders and asked their willingness to participate in the study and

gave our network permission to share our questionnaire forward to relevant people. Also, both of us created a post about the questionnaire to our news feed and to one relevant LinkedIn group.

Participants completed the online questionnaire anonymously (Sue & Ritter, 2007; Hirsjärvi, Remes & Sajavaara, 2009), and identification codes were created for each completed questionnaire (P1-P9). In this study, the participants were working in Finland (n=6), Sweden (n=2) and the United States (n=1), and some of the leaders' team members worked in different countries. Little more than half of the teams consisted of one nationality, for the rest of the teams being multinational. The most common amount of team members lied under five (4 out of 9), but also teams with over 20 members existed (3 out of 9).

3.3 Research design and data collection

This case study has been designed to investigate how resilience-related factors occur in the context of virtual teams, from the virtual team leaders' perspective, as well as what actions appear by the virtual team leader in situations that require team resilience. The data for this study was gathered through web-based online questionnaire (Hirsjärvi, Remes & Sajavaara, 2009; Sue & Ritter, 2007; Valli & Perkkilä, 2018) over two-week period in autumn 2018, from the end of September to the middle of October.

This study is approached qualitatively, which means exploring the phenomenon in its natural environment, interpreting it in the light of the information given by people (Denzin & Lincoln, 2011), and revealing the facts instead of verifying existing claims (Hirsjärvi, Remes & Sajavaara, 1997; Lichtman; 2013). Also, our choice to use a case study design allowed us to create an in-depth understanding about the subject which in turn creates the opportunity to expand existing theories related to team resilience in practice (Flyvbjerg, 2006; Simons, 2009; Yin; 2009).

The questionnaire was created in Finnish, Swedish and English and it consisted of four sections 1) questionnaire introduction, 2) background information, 3) general questions: working with virtual team, and 4) team resilience. Sections 2, 3 and 4 included a total amount of 15 questions (see Appendix A, B & C) including both open-ended questions and closed-ended multiple-choice questions (Sue & Ritter, 2007). Each question, starting from the question 4, were designed to measure some components of resilience: third section focused more on lead-

er's practices on working with a virtual team whereas the last section emphasized virtual team leader's actions in challenging, team resilience-requiring situations. Also, the first set of questions in the section 2 aimed to ensure that the criteria for a virtual team leader were met.

The questionnaire was sent to participants in electronic form, via Google Forms, and in order to submit it, participants had to answer each of the questions. The main reason for using the online questionnaire was that we aimed at a geographically wide sample, so web questionnaire allowed us to collect data despite of people's geographical location and send it conveniently also to a larger group (Hirsjärvi, Remes & Sajavaara, 2009; Sue & Ritter, 2007). Other benefits we considered were the convenience and fastness when delivering a questionnaire and returning a reply form and the possibility to optimize questionnaire for different devices (Valli & Perkkilä 2018; Sue & Ritter, 2007).

3.4 Description of the analysis

In this study, qualitative theory-oriented content analysis is used (Tuomi & Sarajärvi, 2009). Data analysis started with the familiarization with material from questionnaire data. First both of us analyzed all units independently followed by a combination and embedding of results. Each leader's questionnaire responses include sentences and expressions, which are units of analysis being examined. The first research question, "How factors, which affect team resilience, appear in practice in the context of virtual teams?" sought to answer how different parts of resilience, that were assessed by closed and open-ended questions number 4-9, (see appendices A, B, C), occur in teams of this study from the leader's perspective. The second research question, "What actions appear by the virtual team leader in situations requiring team resilience?" was answered by analyzing questions 10-15, which are open-ended questions aiming to examine leader's practices with a virtual team.

A figure 4 represents the process of analysis and categorization for the first research question. First, parts of resilience were found by analyzing each question separately (Q4-Q9). It was defined, based on the answers, if the same part of resilience (e.g. Q4: diversity), that the question was meant to measure, occurred in the results of each question. Then the answers were summed up based on the simplified units. The analysis is mostly done abductively by creating subcategories from the original material and then moving further into main categories, conclusions and theoretical concepts (Tuomi & Sarajärvi, 2009).

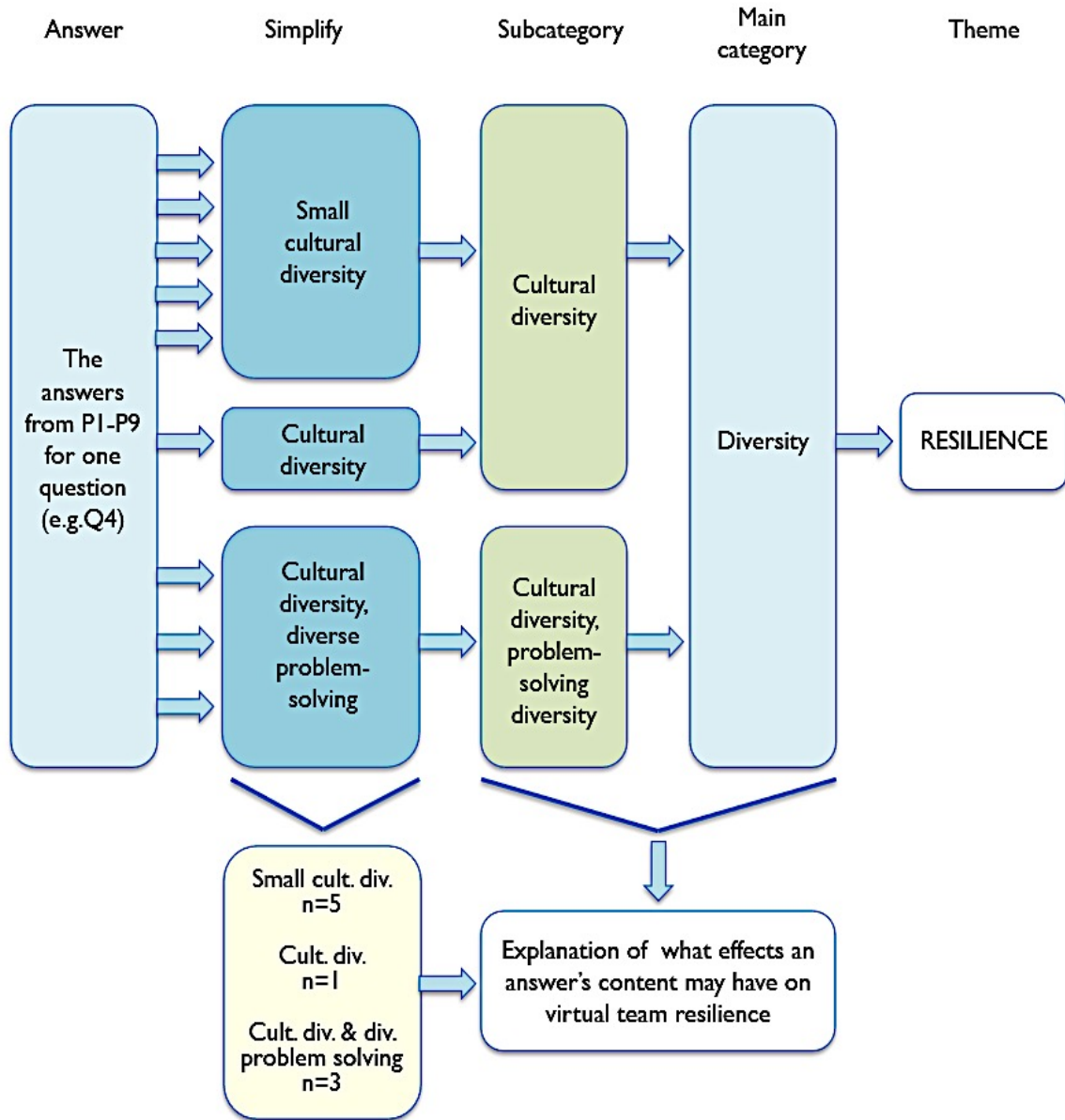


FIGURE 4. An example of the process of analysis and categorization for the research question 1.

As seen in figure 4, the answers for each question were categorized into simplified units of analysis, meaning that information is compressed or divided into shorter, simpler form (Tuomi & Sarajärvi, 2009), which makes it easier to carry out analysis. After categorization of expressions, main categories were grouped into themes emerged from the content analysis. Because questions 4-9 were built to assess specific parts of resilience, it was possible to directly try to find these parts and report them. Figure 4 is an example of the question 4, which measured diversity, more specifically a cultural diversity that could be on a low or a high lev-

el. Simplified units were transferred into subcategories, and further into main category (Tuomi & Sarajärvi, 2009). Resilience was the main theme of analysis throughout this section.

After completing the categorization, the appearance of a certain level of one part of resilience was counted. As seen in this example (see Figure 4), about half of the teams had a small cultural diversity whereas half of them had greater cultural diversity, and some had also other properties. Finally, theoretical knowledge and empirical results were combined to conclude what effects these results may have on virtual team resilience.

Analysis of the second research question differed slightly from the analysis of the first one and a different path was used to find the main categories as well as to analyze them because questions 10-15 were open-ended questions. First, the answers were simplified and the subcategories were defined like in the analysis of the first research question. After the definition of subcategories, the parts of resilience were identified. Because questions in research question 2 didn't measure a specific part of resilience, multiple dimensions of resilience occurred in the answers of each question. The aim of this analyze was to find how many different parts of resilience arose from each answer in Q10-Q15 (see figure 5).

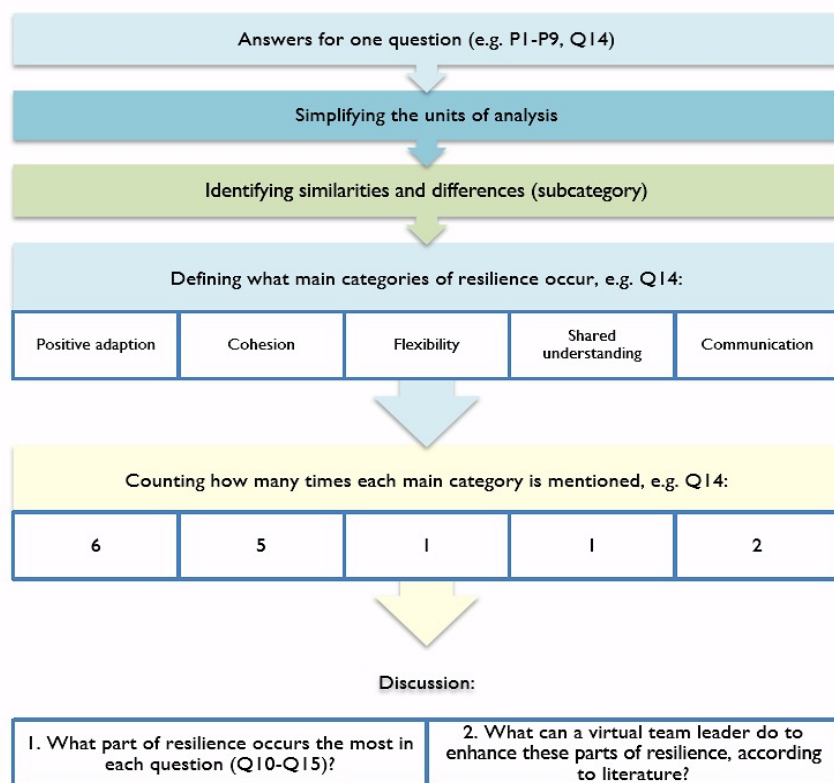


FIGURE 5. An example of the process of analysis for the research question 2.

Figure 5 is an example of the analysis of the question 14, where five different parts of resilience were found (positive adaption, cohesion, flexibility, shared understanding and communication). In research question 1, resilience was the theme of analysis in all answers and therefore the main categories were something within resilience. However, as can be seen in figure 5, one answer could include multiple dimensions of resilience in this section, so we counted how many times one dimension of resilience was mentioned (for example in Figure 5, communication was mentioned six and cohesion five times). These two were the most mentioned parts of resilience in question 5 and the aim was to find out which two parts of resilience were the most mentioned in each question between Q10-Q15. After defining which parts of resilience were the two most mentioned in each question, the least mentioned were also counted. By defining what parts of resilience occur the most, it's possible to see what actions virtual team leaders practice with their virtual teams in situations that require team resilience. By defining what parts of resilience are the least used it's possible to give guidelines for virtual team leaders about how to enhance resilience in these dimensions.

4 RESULTS

The results are presented according to two research questions: how the factors, which affect team resilience, appear in practice in the context of virtual teams and what actions appear by the leader in situations requiring team resilience. The first question is answered by the participants' replies for questions 4-9 and the second question by the replies for questions 10-15.

4.1 The occurrence of factors related to team resilience in the context of virtual teams

Diversity of teams, Q4

The multiple choice question 4 ("My team consist of...") measures the level of cultural and expertise diversity. It was possible to answer this question by choosing one or many of four following options: *members from one country*, *members from different countries*, *members with same kind of expertise*, *members with different kind of expertise*. Small cultural diversity means that a team consists of one nationality, whereas greater cultural diversity means a team consists of at least two different nationalities. The diversity of problem solving was measured with the question about diversity of expertise, which examines if there is same kind of expertise or different kind of expertise within a team. Three teams answered this question. Different cultural norms can affect the diversity of problem solving, but the impact of cultural norms isn't studied in this research. The distribution of responses is seen in table 1.

Subcategory	n	%
Small cultural diversity	5	56 %
Greater cultural diversity	1	11 %
Greater cultural diversity, diverse problem solving	3	33 %
N	9	100 %

TABLE 1. Question 4 subcategories

Five of the teams consist of members with same nationality that is interpreted as small cultural diversity. One team consisted of different nationalities, which is seen as a greater cultural

diversity, and rest of the teams composed of both multiple nationalities and different kinds of expertise, which are interpreted as having a greater cultural diversity and diverse problem solving. As a result, teams in this study have different levels of cultural diversity but the level of problem solving diversity cannot be assessed.

The emergence of cohesion in teams, Q5

Cohesion was built mainly by communication and trust, but a coherent team needs also a common history. Working with the same team members for a longer period of time was seen as an enhancing factor for cohesion. This question measured how often the same team structure was used: if the same team is used multiple times, it has a higher possibility for enhanced cohesion, and if the members change per project, the cohesion remains low. Participants could choose if team members are used multiple times, if they change per project or they could give some other answer (see table 2). One participant answered, “*Some teams are also stable*” which is interpreted as participant having multiple teams where some teams are used multiple times and rest of the teams change per project.

Subcategory	n	%
Cohesion possible	6	67 %
Small cohesion	2	22 %
Cohesion possible, small cohesion	1	11 %
N	9	100 %

TABLE 2. Question 5 subcategories

Most of the teams (n = 6) are used multiple times. This is related to higher possibility for team cohesion, leading to better resilience. Common history didn’t automatically lead to higher level of cohesion but the possibility for it enhanced, and therefore the result of working together multiple times is interpreted as “cohesion possible”. 2 out of 9 leaders changed team members by project, which is interpreted as having a smaller possibility for cohesion, in short “small cohesion”. In this study, most of the teams tend to have higher possibility for cohesion.

Team members' roles and diversity within the team, Q6

This question measures the clarity of roles by asking about what kind of roles the participants' team members had. Most of the teams seem to have very clear roles ($n = 8$) as seen in table 3. If the answers gave a clear picture about what roles each member has (for example, one team consisted only of recruiters, another had different specialists, assistants and researchers), they were categorized as having clear roles, which enhances trust. The diversity of expertise was also measured: if the virtual team consist of one kind of specialists such as recruiters they are interpreted to have small level of diversity, whereas a team that consist of members with different roles are categorized as having a higher level of diversity. Medium diversity means that there are two different roles in a team and high diversity means there are three or more different roles in a team. The results of the categorization can be seen in table 3.

Subcategory	n	%
Clear roles, small diversity	3	33 %
Clear roles, medium diversity	3	33 %
Clear roles, high diversity	1	11 %
Clear roles, high cohesion	1	11 %
Less clear roles, low cohesion	1	11 %
N	9	100 %

TABLE 3. Question 6 subcategories

Only one team changed roles by project and this results in less clarity about the roles that every team member have. Two of the leaders' answers gave a little information about the level of diversity in their teams but their answers include perspectives about the cohesion in their team (*"We're one team based on everyone's knowledge"*). As a result, virtual teams in this study have a high clarity of roles, which enhances trust, but the level of diversity varies a lot. The variation of diversity is also seen in results of Q4, where cultural diversity was measured. High diversity was related with versatile problem solving and good flexibility.

The amount of face-to-face communication in virtual teams, Q7

Participants were asked how often their team members meet each other face-to-face: often, occasionally, rarely, or never. It was also possible to answer “other” and give an explanation for the answer. If team members meet each other often face-to-face, they are seen to have high nonverbal communication. Face-to-face communication was the most effective way to enhance trust and cohesion, because it includes a very high amount of social hints. Because this research studies virtual teams, it’s no surprise that only two teams have a high level of nonverbal communication (see table 4).

Subcategory	n	%
High nonverbal communication	2	22 %
Med. nonverbal communication	3	33 %
Small nonverbal communication	2	22 %
No nonverbal communication	2	22 %
N	9	100 %

TABLE 4. Question 7 responses

Two of the teams met often face-to-face, which means they have a high level of nonverbal communication. Three teams met occasionally, which is interpreted as having a medium level of nonverbal communication. Two of the teams met rarely face-to-face, which is categorized as having small nonverbal communication. One of the teams that has small nonverbal communication have some members who meet each other, but the rest of the members never meet face-to-face (*“The most of them have never met face-to-face”*). Two teams have no nonverbal communication because their teams have no face-to-face meetings but the leader of the other team highlighted that their team members have met each other for several years ago. As a result, virtual teams in this study have variable levels of nonverbal communication. Nonverbal communication can be delivered by communication technology, but that isn’t yet measured in these answers.

Communication technology platforms used for interaction with team members, Q8

This question is analyzed in two phases: first, all different communication methods that are used in each team were counted and second, the richness of communication was measured by the communication method (e.g. written, spoken) and how often communication happens with different platforms. The most used platforms are described on top in table 5, whereas the least used platforms come last. The more social hints a certain communication method delivers, the richer the communication is and the more it affects positively on the level of resilience. If teams communicate only by writing, the amount of social hints is more likely to be low but this can be compensated with greater quantity of written communication, including good communication frequency and routine.

Platform	n	%
Skype	9	100 %
Drive (Google or OneDrive)	5	56 %
Email	5	56 %
Instant chat	3	33 %
Zoom	2	22 %
Trello	1	11 %
Sharepoint	1	11 %
LinkedIn	1	11 %
Phone calls	1	11%
Parco	1	11 %
Dropbox	1	11 %
Facebook	1	11 %

TABLE 5. Communication technologies used by teams

Skype is the most common way to communicate (100 % of teams used Skype). This is seen to compensate the lack of nonverbal communication that occurred in the answers of Q7. Skype offers the chance to deliver nonverbal information so even those teams that had no nonverbal

communication in Q7 (n=2), actually have a possibility to see each other virtually. This raises the amount of social hints that are delivered in virtual communication, and rich communication enhanced trust and cohesion in teams. The second used platforms are Drive and email (56 %) and the third used platforms are instant chats like Whatsapp or Facebook messenger (33 %). Platforms like Drive (Google or OneDrive) and instant chat offer a possibility to communicate and work simultaneously, so the usage of them can enhance the richness of communication.

The other analysis is done again by finding the subcategories for communication, which is a category of resilience. The usage of communication platforms gave information about how team members deliver information virtually: having rich forms of virtual communication means that the used communication method transfers a lot of information, like videoconferences (Skype) or phone calls. One of the teams has medium forms of virtual communication because the participant emphasized how written communication was the primary way to communicate. See table 6 for results below. Only one team has medium level of communication, the rest of the teams use rich forms of communication.

Subcategory	n	%
Rich communication, daily communication routine	3	33 %
Rich communication	4	44 %
Rich communication, F2F-meetings once a month	1	11 %
Medium communication	1	11 %
N	9	100 %

TABLE 6. Question 8 subcategories

Based on responses, most of the team leaders use rich forms of communication to collaborate with their team members (8 out of 9), but only three of them express a good, daily communication routine. One team has face-to-face meetings once a month, which enhances the richness of communication because the meetings happen with a certain routine and a high amount of social hints are delivered during these meetings. Communication was a crucial way to enhance team resilience.

The ways how virtual teams deal with problems, Q9

Every team has a high diversity of problem solving (see table 7) which means they deal with issues from the beginning to the end. Dealing with the problem from the beginning to the end means that teams deal with both problem definition and problem solving, giving them more “autonomy” to decide what working methods will be used and what solutions are to be made related to the problem. A team with a high diversity of problem solving can also make more independent solutions related to tasks, because the team is responsible for dealing with the problem through its whole lifecycle. This autonomy makes a team more flexible, because the members know all the dimensions of the problem and they are instantly able to react on possible adversities related to this problem.

Subcategory	n	%
High diversity of problem solving, high potential for flexibility	8	89 %
High diversity of problem solving, high potential for flexibility, clear roles	1	11 %
N	9	100 %

TABLE 7. Question 9 subcategories

All teams have high diversity of problem solving and therefore high potential for flexibility, which were enhancing factors for team resilience. One participant described their task division strategy (*“If the issue is on the client side a PM will get into, if it is pricing sales will get into...”*). This clarity of roles (n=1) affects the trust between team members, which again affects resilience in a positive way. Therefore, based on this question, every team has a good chance to reach enhanced flexibility and therefore greater resilience. This result compensates a bit the results from Q4 and Q6, because the levels of cultural diversity and diversity of expertise varied and teams didn’t seem to have a great level of diversity.

4.2 Actions that appear by the virtual team leader in situations requiring team resilience

The most stressful factors for virtual teams in their organizations, Q10

According to virtual team leaders, the most stressful factors for virtual teams in their organizations were unpredictability, information loss, traveling, amount of work, asynchronized communication, timetable issues, communication misunderstanding, poor information, language issues, different competencies of team members, lack of relevant education, self imposed restraints and overpromising.

Issues with *communication* are the most common factor causing stress. 5 out of 9 mentioned these kinds of issues (information loss, asynchronized communication [*“lack of peer support in hectic situations, when the answer is directly needed”*], timetable issues, communication misunderstanding, language issues). Information loss, communication misunderstanding, poor information and language issues were all main categorized under both *communication* and *shared understanding*. Overpromising (*“sales team over promises”*) is also seen as a lack of *shared understanding* because all team members should be aware of what the team can achieve. 4 teams out of 9 suffer from issues in shared understanding. The main category *problem solving* is also linked with overpromising. The amount of main categories that were mentioned by participants is counted on table (8) below.

Main category	How many times mentioned	%
Communication issues	5	56 %
Shared understanding issues	4	44 %
Flexibility	3	33 %
Problem solving	1	11 %
Trust issues	1	11 %
Recovery	1	11 %

TABLE 8. The amount of main categories that are mentioned as stressors.

For three of the teams, the most stressful factors are related with *flexibility* (unpredictableness of job, timetable issues and overpromising). The change of work and reacting to it, forecasting, making compromises about timetables and fulfilling over optimistic promises require flexibility to be able to suddenly change direction. Issues in *trust* are seen to appear as different competencies and as a lack of relevant education. One participant mentioned the work amount to be a stressor, which is interpreted as the need for good *recovery* skills. It may contain a lot more, but because this isn't explained, it won't be further analyzed.

Preparing for possible future stressful situations, Q11

Virtual team leaders prepare their teams for possible future stressful situations by predicting, practicing, sharing information effectively, having regular meetings, using open communication channels for instant contact, knowing the process, being proactive, providing support, communication, learning, education, and planning. *Communication* seems to be one vital tool in preparing for possible adversities (see table 9): 7 out of 9 mentioned communication as a constructive tool. Four participants answered that actions like predicting and practicing (e.g. “*by defining what adversities might come and by training skills*”), knowing the process, effective information sharing and discussions were used to prepare for stressful situations. These are interpreted as a part of *shared understanding* because these are the ways to get an overall idea of what could happen in the future and to share information concerning the possible adversities.

Main category	How many times mentioned	%
Communication	7	78 %
Shared understanding	4	44 %
Flexibility	4	44 %
Trust	3	33 %
Positive adaption	2	22 %
Cohesion	1	11 %

TABLE 9. The amounts of how many times the categories in resilience were mentioned in preparing for possible stressful situations.

In four teams, *flexibility* is recognized as a preparing tool. Members are ready for an instant contact when needed and they predict and analyze different scenes to react on, if necessary. Counting on other's response ("*by being easy reachable, always some of us*") is interpreted as a category for *trust*. Trust (n = 3) in these answers is related with support giving, but it is also linked with *cohesion* (n = 1). Two participants gave answers that are linked with *positive adaption* (learning from before [*"learn from previous projects and invest in inner education"*]) and individual proactivity [*"familiarizing beforehand and everyone's own proactivity"*]).

Communication leads to better shared understanding, which in turn affects the capacity for flexibility within the team. Answers that didn't highlight information sharing but included communication, can, in reality be situations where shared understanding enhances, but this cannot be reported because it is not directly mentioned.

Strategies under stressful situations, Q12

Strategies that virtual team leaders used with their team during stressful situations were peer support, enhanced communication, clear roles and communication, substituting, sharing workload, preparing, clear planning, prioritizing, learning, instant communication, and goal setting. Also "*work organization*" strategies were mentioned, but this is hard to categorize under any part of resilience because it isn't clear what these strategies were.

Enhanced *communication* is the most mentioned strategy to be used in stressful situations, as seen in table 10. This usually means that during stressful situations, team members are more active in communicating with each other. Also, such aspect arose that the task is completed as good as possible and enhanced communication happens after completing the task ("*We fulfill the tasks and discuss when everything is over. We can then come up with better ways to complete tasks*"). This can be interpreted as debriefing, a good concrete action a team can do to enhance resilience for future adversities, but it wasn't clear how quick this enhanced communication occurred after adversity. It is placed under category *positive adaption*.

Main category	How many times mentioned	%
Communication	5	56 %
Flexibility	4	44 %
Trust	3	33 %
Problem solving	1	11 %
Positive adaption (debriefing?)	1	11 %
Cohesion	1	11 %

TABLE 10. How many times certain parts of resilience were mentioned in the answers.

Team members become more *flexible* during adversities ($n = 4$), and some of the teams invest in building and exploiting *trust* ($n = 3$) during challenges (e.g. “*Goal setting and work sharing*”). Dividing tasks between team members and counting on others input is related with trust. Roles were also clarified to enhance effectivity, and clear roles were a subcategory for trust. Preparing for all kind of situations was categorized under *problem solving* ($n = 1$), because it requires a lot of creativity and building possible models for how a situation may escalate. One answer was categorized under *cohesion* and communication (“*We share the pain between us and enhance communication within team*”), because team members focused on supporting each other and enhancing discussion between team members.

Analyzing stressful/hectic situations, Q13

Virtual team leaders used different kind of strategies to analyze stressful or hectic situations afterwards with their team. The following practices emerged from the answers: learning from success and failures, having discussions, defining success and failures, giving suggestions, giving feedback, praising, offering help when needed, defining failures, and, of special note, one team reported that they didn’t always have formal analyzing because of the lack of time (“*Usually no time and we move on. We may discuss during a team meeting but no formal process.*”).

Again, *communication* is the most common factor that arose in the answers, as seen in table 11. On the other hand, the analysis process about adversities in team requires communication, so this question maybe led the answers towards communication. Teams discuss about success

and failures, have development discussions, make suggestions and check what they could have done differently.

Main category	How many times mentioned	%
Communication	6	67 %
Positive adaption	3	33 %
Cohesion	1	11 %
Trust	1	11 %

TABLE 11. Which parts of resilience were mentioned in analyzing adversities afterwards.

Some of the units that describe communication are also categorized under *positive adaption* ($n = 3$). Aiming to learn from success and failures (e.g. “*We go through the success and failures, we try to learn from them*”) happens via communication but includes a clear aspect of learning, in other words positive adaptation. Giving feedback is also communication, but it helps team members to define failures and to learn how things went and what they can do better next time. Offering help when needed (*cohesion*, $n = 1$) may signify that there is no formal analyzing after an adversity (“*Everyone has been pleased with received help*”), which could refer to a neutral effect on resilience, but in this case the level of cohesion seems to be high if help is given between team members and everyone are satisfied with that. This same answer was also categorized as *trust*, because members have divided work tasks and counted on others’ investment.

Learning from the latest success, from the view of resilience, Q14

According to team leaders, virtual teams learned following things from their latest success: substance learning, teamwork, flexibility, self-regulation, information sharing, communication, and about the project issues. Most of the answers included an aspect of teamwork (e.g. “*even the most stressful situations are possible to overcome with teamwork*”), or the notion of that “*everybody was needed*”, and “*teamwork was the key factor for succeeding*”.

Teamwork is categorized under *cohesion*, because coherent team’s members trust each other and communicate enough, and therefore can truly hold together even during adversities. Dif-

ferent kinds of substance learning refer to positive adaption, which is the most occurring part for this question (see table 12).

Main category	How many times mentioned	%
Positive adaption	6	67 %
Cohesion	5	56 %
Communication	2	22 %
Flexibility	1	11 %
Shared understanding	1	11 %

TABLE 12. How many times one part of resilience was mentioned as an aspect of learning from the latest success.

This question was about learning, so that aspect appeared in the most of the answers (*positive adaption*, $n = 6$). From adversity, teams learned about substance, how their team works and how they really can count on each other. This sort of good teamwork is also categorized under *cohesion* ($n = 5$), because the factors like succeeding together enhance team cohesion. One participant also pointed out the meaning of *flexibility* of team members (“*The team spirit was good; everyone stretched as needed and the final result was good. Nobody needed to sacrifice, and still other priorities [home etc.] remained as number one [meaning work comes after health/family]*”). Everyone regulated their actions and nurtured prior things like family life, but also helped each other at work in the team. In this situation, team spirit was held up all the time, while trying to stretch during adversity. The unit “information sharing” is categorized as communication, but also as *shared understanding* ($n = 1$).

Learning from the latest misfortune, from the view of resilience, Q15

Units that describe the answers for “What did your team learn from its latest misfortune?”, were clarity of responsibilities, fact checking, more interfering, changing direction when needed, too low communication, too low proactivity, importance of rules, acceptance, working methods, technology, beware of blaming others, team cohesion, communication, trust, and acceptance. When a team failed to complete a task, the most common unit they failed in was

checking the facts (categorized as *trust*, $n = 5$), three of the participants mentioned it as a need to do during an adversity.

Four teams had problems in *communication* during the latest adversity (see table 13). In two cases, team members didn't communicate enough, and some communications were over optimistic or too unclear ("*communication should be clear*"), which caused trouble. Issues in *shared understanding* ($n = 2$) are linked with too low proactivity, meaning that individuals didn't seek for information and therefore a shared understanding wasn't reached ("*There wasn't enough communication, things weren't asked proactively*"). There were also problems in understanding the game rules that the team follows. This is categorized under cohesion, because lack of understanding the information and the shared norms affect cohesion.

Main category	How many times mentioned	%
Trust	5	56 %
Communication	4	44 %
Shared understanding	2	22 %
Cohesion	2	22 %
Flexibility	1	11 %
Positive adaption	1	11 %
Problem solving	1	11 %

TABLE 13. How many times each part of resilience was mentioned in learning perspective from the latest misfortune.

Issues in *cohesion* were still mentioned ($n = 2$). During adversity, team members may start blaming each other, or the coherence of the team isn't so good in other ways. One participant mentioned the importance of interfering and changing direction if needed ("*Interrupting and changing things should occur if needed*"), which is categorized as communication and *flexibility*. Team members seemed to lack flexibility during an adversity, which led to misfortune. One team had problems in learning and accepting new working methods (troubles in *positive adaption*), and therefore tried to solve problems in old ways (troubles in *problem solving*).

4.3 Summary of the results

Overall, the results for research question 1 demonstrated how the most common team resilience-related factors appear in the context of virtual teams, according to virtual team leaders. About half of the teams have greater cultural diversity ($n=4$, Q4), and for the most of them cohesion is also possible ($n=6$, Q5). Almost every team have clear roles ($n=8$, Q6), and all of the teams use video-conferences (Q8) which enhances the sharing of social hints and thus compensates the lack of nonverbal cues. The results show that in overall, 8 out of 9 use rich forms of communication (Q8). Also, eight teams have high diversity problem solving (Q9) and therefore have high potential for flexibility. All of these are enhancing parts of resilience. However, the level of diversity regarding different expertise varies a lot between teams (Q6). The degree of nonverbal communication also varies a lot (Q7), but this is not a surprise since virtual teams are studied.

The results for the research question 2 shows what actions appear by the virtual team leader in situations requiring team resilience and how the theory of Alliger et al. (2015) about the typical behavioral strategies of resilient teams occurred in practice among teams, from the leaders' point of view. Minimizing occurred by recognizing the factors that cause stress (Q10), which in this study are mostly related to the issues with communication, issues with reaching a shared understanding, and troubles with flexibility. These were also recognized as the common challenges of virtual team leadership in the literature. The other aspect of minimizing is the preparation for possible stressful situations (Q11), and in this study communication, shared understanding and flexibility played the biggest role in preparing team members for the unexpected adversities.

Managing stressful situations (Q12) happened mostly via communication, flexibility and trust. It can be seen that during adversity, communication reduces, and that was also mentioned as the most stressful factor in Q10. Mending happens after the adversity, and when analyzing afterwards the actions that happened during the adversity (Q13), communication and aspects of positive adaption appear in most of the answers. Since it wasn't asked how directly a discussion is performed after overcoming a stressful situation, the level of debriefing, which was also part of the mending process, cannot be evaluated. Teams learned about factors related to the positive adaption and cohesion from their latest success (Q14), whereas factors related to trust and communication was learned from the latest misfortune (Q15). The most obvious finding that emerged from the analysis was the importance of communication in virtual teams.

It is interesting, how communication caused the biggest issues in virtual teams but at the same time communication was the most used tool in virtual team working. Communication was the most used tool in the preparation phase but it reduced during adversity and enhanced again after adversity. Still nobody mentioned communication as a learning aspect when analyzing challenging situations afterwards.

To summarize the results, communication is the most used tool to enhance resilience but positive adaption, trust, shared understanding, flexibility and cohesion are mentioned as well. Issues in communication and shared understanding are the biggest stress factors for virtual teams in this study. In contrast, the least mentioned strategies in resilient-requiring situations are cohesion, problem solving, positive adaption and flexibility.

5 DISCUSSION

This study aimed to explore the occurrence of factors related to team resilience from the leader's point of view, in the context of a virtual team, and the actions that appear in team resilience-requiring situations, by the leader. Virtual teams challenge their leaders with the complexity, which should be considered in leadership style and functions. Combined with continuous challenges teams face in today's hectic business world, the ability to withstand and overcome tough situations, team resilience, is crucial part of every team's success. By identifying the main factors related to team resilience, the leader can enhance this feature and lead their team to success.

5.1 Team resilience as an asset of virtual teams

The first question in this study investigated how factors, which are seen to affect resilience, appeared in practice in virtual teams, from the leaders' point of view. Visible only when challenges occur, team resilience, referred also as a team's capacity to tolerate and overcome tough situations (Alliger et al., 2015), is vital for teams to survive in today's hectic and competitive world and the stressors it imposes (Dimas et al., 2018). Prior studies have noted that a resilient team is able to bounce back after the stressful situation, having also the ability to face future challenges, empowered than before (Vera, Rodríguez-Sánchez & Salanova, 2017; Alliger et al., 2015).

Team resilience is a capacity to positive adaptation (Soon and Prabhakaran, 2018) that is composed of many multidimensional factors with **communication** being the most significant one, according to several prior studies (see e.g. Maduka et al., 2018; Han et al., 2017). Although the role of communication in enhancing team resilience is undeniable, it should be noted that the high quantity of discussion alone wouldn't necessarily lead to quality communication (Nilsson, 2005). 8 out of 9 virtual team leaders in this study used rich forms of virtual communication, and only one was defined to use medium forms of virtual communication because the primary tool for communication was reported to be email, which contains a low amount of communicational data (see e.g. Gazor, 2012). The less data is sent via certain

communication method (email vs. Skype or face-to-face), the more discussion must appear to help the receiver to decode the message (Morgan et al., 2014).

According to the literature, nonverbal communication leads to better trust, which in turn can lead to better cohesion in team, and all these are enhancing factors of resilience (see e.g. Nilsson, 2005; Gazor, 2012; Morgan et al. 2014). In this study, the level of nonverbal communication varied a lot between teams with two teams having high nonverbal communication because of frequent face-to-face meetings, three of teams having medium nonverbal communication, and two teams having a small nonverbal communication. Two virtual team leaders reported that they didn't have any nonverbal communication, but the other one of these teams had met once, several years ago. After all, also one face-to-face meeting even in the beginning of the project helps to enhance team's trust and cohesion (Morgan et al., 2014). Regarding the communication routines, half of the team leaders reported of having a good communication routine, which ensures that members have the chance to discuss with each other with certain time intervals (Morgan et al., 2014). Unfortunately, it should be noted that many of the participants skipped this question, so an overall picture is hard to get.

Another resilience-enhancing factor in teams is **trust** (see e.g. Gazor, 2012; Soon & Prabhakaran, 2018), which is even more crucial in the context of virtual teams, because working usually happens regardless of time and space and it is more challenging to follow what team members are doing (Snellman, 2013). In our study, trust was measured by finding out how clear roles (Snellman, 2013) team members have (Q6) from the leader's point of view and how much they meet face to face (Q7) which in turn leads to better trust (Snellman, 2013). In our case, 8 out of 9 teams had clear roles between team members, which predicts a better trust and therefore better resilience in team (Morgan et al., 2014). On the other hand, the level of nonverbal communication (Q7) varied a lot between our participants, which also affects to the level of trust in teams (Morgan et al., 2014).

Also, one team changed roles by project, which reduces the clarity of one's role (Snellman, 2013). On the other hand, this may enhance creativity (Han et al., 2017). An aspect of trust was also mentioned in Q9, where one virtual team leader highlighted the importance of role clarity. However, every team used video platforms in virtual communication (Q8), which again is the best way to deliver social hints if there is no chance to face-to-face meetings (see e.g. Nilsson, 2005). Because our research is about virtual teams, it's common that most of the teams and their members do not meet each other in real life (Ryan, 2010).

Cohesion refers to strong commitment of each team member, and together with the shared understanding it will add accountability of team members (Ryan, 2010) and thus it is also an important part of team resilience (see e.g. Herrman, 2011; Maduka et al., 2018). Cohesion constructs over time when people experience things together and share a common history (Snellman, 2013). High nonverbal communication, which is rich in social hints (Morgan et al., 2014), leads to greater trust, which again leads to better opportunities to build cohesion (Gazor, 2012). In this study, most of the teams (n=6) worked with the same team members and as mentioned under “Communication” in this discussion, the level of nonverbal communication varied a lot which means there would also be a lot of variety in cohesion (Morgan et al., 2014; Snellman, 2013). However, as mentioned above, every team used videoconferences (Q8) in communication, which give a lot of social hints (Morgan et al., 2014). Because it isn’t clear how often communication occurred in every team, it can be suggested that in over half of the teams (n=6) cohesion building was well possible (Q5). Also, in the question 6, two of the participants gave information about how roles are defined in their teams: the other one said that they are one unit as a team and have a high cohesion, and the other gave an answer about team having different roles in different projects, which is linked with both low level of trust and cohesion (Snellman, 2013).

In this study, over half of the teams had a small cultural **diversity**, which may lead to low diversity of population characteristics (Herrman et al., 2011). Cultural diversity leads to wider problem definitions and more versatile **problem solving** (Gazor, 2012), and it can result in greater creativity (Han et al., 2017), knowledge, and skills within a team (Juntunen, 2014). Because it’s difficult to determine the creativity of teams, the diversity of problem solving was investigated (Q9), and virtual team leaders in this study reported that their teams both define the problem and solve problems, which are seen as a diverse problem solving. This in turn enhances team **flexibility** as well as cultural diversity: the more variability there is within a team, the more flexible it is and therefore it has better chances to transform, which again is linked with **positive adaption** (see e.g. Juntunen, 2014). Because every team had high diversity of problem solving, but only about half of the teams were culturally diverse, it is suggested that half of the teams in this study had greater chances to be flexible and maintain positive adaption, whereas the other half could suffer a bit from its low cultural diversity. It is to be noted that the diversity of expertise isn’t analyzed.

5.2 Preparing for, withstanding and learning from the resilient-requiring situations

The second research question in this study sought to determine those actions that appear in situations requiring team resilience, according to the virtual team leaders. As the study progressed, the notion is made that the same kind of themes appeared in the results reported by team leaders than in the behavioral strategies of resilient teams (minimizing, managing and mending), described by Alliger et al. (2015) and therefore our results are discussed in relation to this theory.

Minimizing

Recognizing existing or future threats help teams to prepare for them, which is also typical behavior for resilient teams (Alliger et al., 2015). In this study, factors that caused the most stress for virtual teams were related to communication and information sharing. Focusing on communication quality and routine help also with information sharing, which leads to better shared understanding (Morgan et al., 2014). Also, flexibility-related issues, issues with trust, problem solving and team's recovery were mentioned as stressful factors. Flexibility refers to the unpredictability of work as well as for example challenges in adjusting timetables if people are working in different locations or time zones. The unpredictability of work is challenging, because preparing for unpredictable situations means coming up with multiple scenarios that might happen in the future (Alliger et al., 2015). A good question would be, in what ways is the job unpredictable?

In addition to anticipating challenges, virtual teams must understand their current readiness, identify early warning signs and prepare to handle stressors to be able to minimize challenges before they occur (Alliger et al., 2015). In this study, preparing happened most via communication such as predicting situations, sharing information effectively, having regular meetings, having open communication channels, reaching out instantly when problems occur.

Managing

Communication was also the most mentioned factor when managing stressful situations, but being flexible, for example by taking over other's responsibilities or by prioritizing what to do, was almost as usual within virtual teams in this study. Assessing challenges quickly and accurately and maintaining processes under stress help teams to manage stressful situations (Alliger et al., 2015) which were also seen in the answers of virtual team leaders. Also, some teams seek guidance under challenging situation, which is a part of managing adversities (Al-

liger et al., 2015). For example, sharing the workload, being instantly reachable and offering help when needed (flexibility), peer support (cohesion), and discussion about issues together (communication) could be seen as ways to get guidance from others.

Mending

When the challenging situation is over, the resilient team uses mending strategies which, according to Alliger et al. (2015), refers to recovering from an adversity, addressing what the main risks and issues were, learning from these and expressing appreciation. Communication, positive adaption and trust were the most mentioned subjects in mending processes in this study. Also, team debriefing is part of mending, which refers to the situation where the team talks about the situation and create action plans for the future (Alliger et al., 2015). One answer in the question 12 was slightly indicated with debriefing, which is a part of mending (Alliger et al., 2015).

5.3 Enhancing virtual team resilience as a leader

Both abstract and concrete actions for enhancing team resilience as a team leader are described in 2.3.2, and because communication, shared understanding and positive adaption strongly occurred in the answers of this study as used strategies in resilient-requiring situations (Q10-Q15), we take a look at some of the least mentioned parts of resilience to see how leaders could strengthen these dimensions. The least mentioned dimensions of resilience were cohesion, problem solving, positive adaption, flexibility, and recovery. We drop out recovery from the list, since it was only mentioned in Q10 - there's no point in giving instructions to the leaders about a dimension that causes the least stress. In turn, communication issues were causing the most stress in virtual teams, so that dimension will be discussed.

Cohesion was most often the least mentioned dimension (Q11-Q13). Cohesion is mainly constructed by communication and trust, and it is hard to build in a short-time (Gazor, 2012; Morgan et al., 2014; Snellman, 2013). A virtual team leader should encourage the members to take responsibility of group climate, manage interventions, train teamwork among members, ensure quality communication, begin projects face-to-face or by videoconferences, and build long-term commitment (see e.g. Nilsson, 2005; Morgan et al., 2014). Leader's main challenge is technologically mediated **communication** both according to the theory (see e.g. Snellman, 2013) and the results of this study. The results address that the most stress-causing factors

were related with communication and shared understanding (Q10). To enhance resilience by communication, especially during crisis, virtual team leader must provide team members a chance to meet face-to-face or at least via video platforms, and give constant feedback (see e.g. Nilsson 2005; Morgan et al., 2014). Additionally, virtual team leader must manage task-related communication (communication frequency), equal communication, guide how to communicate and after that also ensure rich and truthful communication (see e.g. Gazor, 2012).

Problem defining and solving: First problem for a virtual team leader is how to build and maintain trust despite distance and possible time-issues (Snellman, 2013). Virtual teams are good at brainstorming but they may be too careful in decision-making and taking responsibility for decisions (Nilsson, 2005). To succeed with these virtual team leader must give a vision, time frames, training and support, as well as ensure that outcomes are reported, and shared understanding is created for better problem solving (see e.g. Brewer, 2010).

Flexibility: To enhance virtual team's flexibility, the leader shall manage interventions, facilitate communication, nurture good career development and work-family balance, create plan B:s and long-term plans, and encourage team members to achieve their full potential (see e.g. Vera et al., 2017; Siirtola, 2018). The leader shall also reduce the passivating effect of an adversity by improving team's ability for ***positive adaptation***, which means gaining constantly new knowledge and skills, maintaining optimism and reminding about the temporality of a certain adversity, training teamwork and substance, ensuring safe environment and learning, conducting post-challenge debriefs, and pointing out potential problems (see e.g. Herrman et al., 2011; Fletcher & Sarkar, 2013; Siklander & Impiö, 2018).

Finally, especially *transformational leadership* is seen to lead to a better team resilience (see e.g. Vera et al., 2017). This kind of leader maintains behaviors that enhance team member's ability to face adversities, which leads to the greater team resilience and further to the greater team viability (Alliger et al., 2015). *Shared leadership* in turn can enhance the creativity of the team, which leads to better outcome which in turn leads to better cohesion within a team (Han et al., 2017).

6 CONCLUSIONS

6.1 Implications

Overall, this study has provided a deeper insight into team resilience in virtual team context, as well as allowed us to identify the practices virtual team leaders use with their team to cope with adversities. These findings highlight the importance of communication in a virtual team, seeing that communication is a crucial part for building resilience according to this study. It can also be applied to understand how e-learning processes can be enhanced. Communication is used as a construction tool especially during minimizing and mending phases, but it seems to reduce while an adversity is ongoing (managing phase) and the communication is also mentioned to cause most stress in virtual teams. Therefore, special attention must be paid on all dimensions of communication (see e.g. Morgan et al., 2014): the communication methods (written, videoconferences etc.) and the content of the communication (open communication, communication frequency etc.). If possible, leaders should get their team members to meet at least in the beginning of the project to “kick-start” it, but if this is not possible, other rich communication methods like videoconferences should be used. The less social hints a communication method delivers, the more there must be communication.

This study can also be used to investigate what parts of virtual team resilience are less used, and to see how to enhance these parts of resilience. Our results suggest that virtual team leaders shall encourage diverse team members to share information and to get the opponents to understand what they think, and why they think in a certain way, which leads to greater shared understanding, leading to greater resilience. These results can be utilized for example in communication and stakeholder management, where communication is both the most usual problem and the most used tool to solve problems in different phases of resilient-requiring situations.

The findings of this study also suggest that virtual team leaders should recognize what the true adversities for teams are (Fletcher & Starkar, 2013), since positive adaption processes, such as cognitive flexibility, emotional regulation and active coping occur in a positive way only if they are aimed for winning a real, context-based challenge (Herrman et al., 2011). Healthy adaptation leads also to better flexibility (Siklander & Impiö, 2018), which again leads to better outcome. Trust and cohesion were also among the most mentioned di-

mensions of team resilience in this study so virtual team leaders should build these factors especially to cope through and after an adversity. It is easy for the team to be coherent and for the members to trust each other before resilience-requiring situations, but true resilient actions come alive during challenging situations (Alliger et al., 2015).

6.2 Directions for future research

This research has thrown up many interesting questions in need of further investigation, largely because to our knowledge, this is one of the first attempts to explore the connection between team resilience and virtual team leading. A further study could be conducted with a larger amount of participants to create a deeper understanding of what dimensions of resilience are used, and what actions should be improved to achieve greater resilience. Another way to get a deeper understanding is to get more knowledge about how cohesion, problem solving, positive adaption and flexibility could be enhanced, which were the least used strategies related to resilience. Also, a larger number of respondents would give results that are more generalizable.

Since the culture's effect on resilience wasn't studied, it would be interesting to consider the effect of different cultures in leadership and motivational styles. Although answers were received from different countries, the amount of certain countries varied and the cultural aspect is not observed in this study. When taking different cultures into account, it would be good to gather about the same amount of participants from each country, and have questions that reflect the cultural norms in resilient-enhancing parts. Also, it would be good to know how much difference there is in communication between different cultures. Knowing that cultural norms can affect the way to solve problems, communication can vary a lot.

An overall view was created about how the parts of resilience occur, so analyzing questions one participant at a time would be a possible way to proceed in the future studies. Furthermore, it would be interesting to study about motivations for certain choices in teams: for example, in this study, most of the teams used the same members among several projects and it could be further studied from the leader's perspective, why did they end up with this solution. It would be even more eye opening to study not only the enhancing or decreasing factors of resilience, but the process or the team's ability to change direction. Also how virtual team leaders understand certain terms could be a part of the questionnaire, like for example in Q7 it

is not clarified what “meeting often face-to-face” means to participants and it could be further studied at a deeper level what does a team, and other terms mean for them.

Because communication within virtual team members is the most used tool and the most stressful factor in resilient-requiring situations, it would be interesting to find out the organization’s stakeholders and shareholders effect on communication. Also the usage of “emojis” to get richness in written communication could affect virtual team resilience, or shared leadership. Also, a virtual team leader must achieve a good information sharing, otherwise team members can do a lot but not necessarily the right thing. It would be interesting to combine an aspect like this somehow with lean-theory, which aims to reduce working phase complexity, by focusing on the usage of only those resources that are vital for achieving a quick and accurate, in other words, lean result (Manjunath, 2011).

7 EVALUATION

7.1 Validity and reliability and ethical issues

Reliability of the study refers to the degree of consistency in measurements or research when the study is repeated (Hirsjärvi, Remes & Sajavaara, 2013; Eriksson & Kovalainen, 2008). In this study, our aim was to investigate leader's experiences and practices, and it must be noted that experiences and opinions may change even in short time. The aim was to report about research process reliably and transparently and clearly states the aim of this study. Reliability is also closely related to the data analysis phase in our research: by following systematically certain steps, the aim was to increase the consistency of the research process (see Figures 4, 5) and there were two researchers doing the analysis and crosschecking the findings. The data obtained was already in electronic form written by participants so there was no need to separately enter information or transcribe it, which also increased the reliability (Valli & Perkkilä, 2018).

To increase the validity of this study, referring that the instrument or research method measures exactly what it is meant to measure and the report of research is correct (Hirsjärvi, Remes & Sajavaara, 2013; Eriksson & Kovalainen, 2008), the impartiality of the study is ensured and made it as objective as possible (Tuomi & Sarajärvi, 2009). The way to approach the content analysis is categorized as abductive reasoning, because completely pure inductive data-driven approach is challenging and even almost impossible to implement (Tuomi & Sarajärvi, 2009; Schreier, 2012). For example, categorizing the answers (see e.g. Figure 4) is, despite the theory, a subjective interpretation of the researcher about what parts of resilience appear, and it could also be done in a slightly different way depending on the researcher.

Because the participants were given the opportunity to choose between three languages, special attention was given in designing and translating the questions and survey introduction as well as in the analysis and reporting phase so that the content of the text remains exactly the same regardless of the language. Also, we decided to use both open-ended and closed-ended questions in the questionnaire, and it should be noted that open-ended ones usually offer more valid responses because there are no pre-created responses (Sue & Ritter, 2007). Before we started the data collection, an external person close to our target group first tested the questionnaire. Also, our thesis supervisor checked the survey before sending it.

Research ethics has been considered throughout this research process and are evaluated according to the principles of the National Advisory Board on Research Ethics (2009) which are divided into the following parts: 1) respecting the autonomy of research subjects, 2) avoiding harm and, 3) privacy and data protection. The participation of this study was voluntary and in the beginning of the data collection, we informed potential participants about the facts concerning the study such as the research topic and purpose, the meaning of the participation in concrete and time required for completing the questionnaire, gave our contact details as well as emphasized the confidentiality and anonymity of answers in the questionnaire introduction.

We aimed to transparent and careful research process with a systematic planning and task sharing and proceeded the plan step by step while making sure we had a shared understanding about the common goal. When presenting the results, and in this study overall, we made sure that the writing style is respectful and analytical, and that everything is presented and written honestly. All data collected in this study was anonymous and in the questionnaire design, we kept in mind the fact that the researcher should collect only relevant information and anonymize the personally identifying data as soon as possible (King, 2010). In this study, no specific details, for example, about participants role in the organization was presented to make sure that participants were not identifiable. The data acquired was only used for research purposes and destroyed after this research project.

7.2 Limitations of this study

Although this study was carefully prepared, there are some limitations. First, the sample size of this study was relatively small which should be taken into account in the generalization of the results. However, our aim was to create new knowledge and increase understanding about a relatively new phenomenon and with a case study design, it was possible to obtain in-depth information and expand and generalize theoretical propositions instead of representing larger populations (Yin, 2009). As Flyvbjerg (2006) states, even if the results of the case study cannot be formally generalized, they can provide valuable information for scientific development and society.

Second, when analyzing the responses, we noticed that there could have been a little modification of the questionnaire design and formulation of some of the questions. For example, in the question 8, there were two questions in one, and thus participants can easily miss the other

one. Also, we explained in the beginning of the questionnaire that if the leader works with multiple teams, they could choose the one they work the most with, but it could happen that some participants missed this point. Third, we found a couple of recent articles related to our study after the data collection, which could have modified our questionnaire a bit. Based on them, we would have wanted to ask also from our participants, for example, what kind of team you think is a good team or investigate more if the team debriefing happened, and ask how fast, after overcoming the latest adversity, did leader discuss about it with their team.

Finally, the last remark we made is strongly related to the topic itself because the data collection was completely implemented virtually using the online questionnaire software. This offered considerable benefits, like finding research participants despite their geographical location as well as its fastness and convenience. However, it should be noted that because of the lack of presence of the researcher, it's not possible to control misunderstandings or ensure that participants reply carefully. Also, for example face-to-face interviews might have offered more in-depth information, including nonverbal cues that are missing in online questionnaire. Overall, this study achieved its goal, answered to research questions, and increased our understanding of the subject – it's a good starting point for future research to produce even more versatile material by combining different methods and perspectives in order to study this topical and relatively new subject.

REFERENCES

- Alliger, G. M., Cerasoli, C. P., Tannenbaum, S. I. & Vessey, W. B. (2015). Team resilience: How teams flourish under pressure. *Organizational Dynamics*, 44, 176-184. doi:10.1016/j.orgdyn.2015.05.003
- Bell, B. S. & Kozlowski, S. W. J. (2002). A typology of virtual teams: Implications for effective leadership. *Group & Organization Management*, 27, 14 –49.
- Berry, G. R. (2011). Enhancing effectiveness on virtual teams: Understanding why traditional team skills are insufficient. *Journal of Business Communication*, 48(2), 186-206. doi: 10.1177/0021943610397270
- Bhat, A. B., Verma, N., Rangnekar, S. & Barua, M. K. (2012). Leadership style and team processes as predictors of organisational learning. *Team Performance Management*, 18(7/8), 347-369. doi:10.1108/13527591211281101
- Brewer, A. B. (2010). *A descriptive study of a building-based team problem-solving process* (PhD). Retrieved from Indiana State University, Terre Haute, Indiana
- Creswell, J. W. (2013). *Qualitative Inquiry & Research Design: Choosing among Five Approaches* (3rd ed.). Thousand Oaks, CA: SAGE Publications, Inc.
- Davis, D. D. (2004). The Tao of leadership in virtual teams. *Organizational Dynamics*, 33(1), 47–62. doi:10.1016/j.orgdyn.2003.11.004
- Day, D. V., Gronn, P. & Salas, E. (2004). Leadership capacity in teams. *Leadership Quarterly*, 15(6), 857-880. doi:10.1016/j.leaqua.2004.09.001
- Denzin, N. & Lincoln, Y. (Eds.). (2011). *The Handbook of Qualitative Research*. Thousand Oaks, CA: Sage.
- Dimas, I. D., Rebelo, T., Lourenco, P. R. & Pessoa, C. I. P. (2018). Bouncing Back from Setbacks: On the Mediating Role of Team Resilience in the Relationship Between Transformational Leadership and Team Effectiveness. *The Journal of Psychology*, 152(6), 358-372. doi: 10.1080/00223980.2018.1465022

- Dulebohn, J. H. & Hoch, J. E. (2017). Virtual teams in organizations. *Human Resource Management Review*, 27(4), 569-574. doi:10.1016/j.hrmr.2016.12.004
- Eriksson, P. & Kovalainen, A. (2008). *Qualitative Methods in Business Research*. London: SAGE Publications Ltd.
- Falkheimer, J. & Heide, M. (2008). *Kriskommunikation i ett globalt samhälle*. KBM:s temaserie (4th ed.). Krisberedskapsmyndigheten.
- Fletcher, D. & Sarkar, M. (2013). Psychological Resilience. A Review and Critique of Definitions, Concepts, and Theory. *European Psychologist*, 18(1), 12-23. doi:10.1027/1016-9040/a000124
- Flyvbjerg, B. (2006). Five misunderstandings about case-study research. *Qualitative Inquiry*, 12(2), 219-245. doi:10.1177/1077800405284363
- Gazor, H. (2012). A Literature Review on Challenges of Virtual Team's Leadership. *Journal of Sociological Research*, 3(2), 134-145. doi:10.5296/jsr.v3i2.2247
- Guss, C. L. (1998). Virtual project management: Tools and the trade. *Project Management Journal*, 29(1), 22-30.
- Hambley, L. A., O'Neill, T. A. & Kline, T. J. B. (2007). Virtual team leadership: perspectives from the field. *International Journal of E-Collaboration*, 3(1), 40-64. doi:10.4018/jec.2007010103
- Han, S. J., Chae, C., Macko, P., Park, W. & Beyerlein, M. (2017). How virtual team leaders cope with creativity challenges. *European Journal of Training and Development*, 41(3), 261-276. doi:10.1108/EJTD-10-2016-0073
- Herrman, H., Stewart, D. E., Diaz-Granados, N., Berger, E. L., Jackson, B., & Yuen, T. (2011). What is Resilience? *The Canadian Journal of Psychiatry*, 56(5), 258-265. doi:10.1177/070674371105600504
- Hirsjärvi, S., Remes, P. & Sajavaara, P. (2013). *Tutki ja kirjoita*. (18th ed.). Helsinki: Tammi.
- Hirsjärvi, S., Remes, P. & Sajavaara, P. (1997.) *Tutki ja kirjoita*. (11th ed.). Helsinki: Tammi.
- Hirsjärvi, S., Remes, P. & Sajavaara, P. (2009). *Tutki ja kirjoita*. (15th ed.). Helsinki: Tammi.

- Hoch, J. E. & Dulebohn, J. H. (2017). Team personality composition, emergent leadership and shared leadership in virtual teams: A theoretical framework. *Human Resource Management Review*, 27, 678-693. doi:10.1016/j.hrmr.2016.12.012
- Horwitz, F. M., Bravington, D. & Desmond, S. U. (2006). The promise of virtual teams: identifying key factors in effectiveness and failure. *Journal of European Industrial Training*, 30(6), 472-494. doi:10.1108/03090590610688843
- Hunsaker, P.L. & Hunsaker, J.S. (2008). Virtual teams: Leader's guide. *Team Performance Management*, 14(1-2), 86-101. doi:10.1108/13527590810860221
- Iorio, J. & Taylor, J. (2014). Identifying potential leaders for virtual teams. *Proceedings of the Annual Hawaii International Conference on System Sciences*, 340-349. doi:10.1109/HICSS.2014.50
- Joy-Matthews, J. & Gladstone, B. (2000). Extending the group: a strategy for virtual team formation. *Industrial and Commercial Training*, 32(1), 24-29. doi:10.1108/00197850010311149
- Juntunen, T. (2014). *Kohti varautumisen ja selviytymisen kulttuuria? Kriittisiä näkökulmia resilienssiin*. Helsinki: Suomen Pelastusalan Keskusjärjestö SPEK.
- King, N. (2010). Research Ethics in Qualitative Research. In Forrester, M. A. (Eds.) *Doing qualitative research in psychology: A Practical guide* (pp. 98-118). London: SAGE Publications Ltd.
- Kozlowski, S. & Bell, B. (2003). Work groups and teams in organizations. In W. C. Borman, D., Ilgen, & R., Klimoski (Eds.), *Handbook of psychology* (Vol. 12): Industrial and Organizational Psychology (pp. 333-375). New York: Wiley.
- Kozlowski, S. W. J. & Ilgen, D. R. (2006). Enhancing the effectiveness of work groups and teams. *Psychological Science in the Public Interest*, 7(3), 77-124. doi:10.1111/j.15291006.2006.00030.x
- Lamers, S. M. A. (2012). *Positive Mental Health: measurement, relevance and implications*. Enschede: GildePrint doi:10.3990/1.9789036533706

- Larson Jr., J. R. (2007). Deep Diversity and Strong Synergy. Modeling the Impact of Variability in Members' Problem-Solving Strategies on Group Problem-Solving Performance. *Small Group Research*, 38(3), 413-436. doi:10.1177/1046496407301972
- Liao, C. (2017). Leadership in virtual teams: a multilevel perspective. *Human Resource Management Review*, 27(3), 648-659. doi:10.1016/j.hrmr.2016.12.010
- Lichtman, M. (2013). *Qualitative Research in Education: A User's Guide*. Thousand Oaks, CA: Sage.
- Lämsä, A-M. & Hautala, T. (2004). *Organisaatiokäyttötymisen perusteet*. Helsinki: Edita.
- Maduka, N. S., Edwards, H., Greenwood, D., Osborne, A. & Badatunde, S. O. (2018). Analysis of competencies for effective virtual team leadership in building successful organizations. *Benchmarking: An International Journal*, 25(2), 696-712. doi:10.1108/BIJ-08-2016-0124
- Malhotra, A., Majchrzak, A. & Rosen, B. (2007). Leading virtual teams. *Academy of Management Perspectives*, 21(1), 60-70. doi:10.5465/amp.2007.24286164
- Manjunath H. S. R. (2011). Exploring the Role of Standard Costing in Lean Manufacturing Enterprises: A Structuration Theory Approach. *Managing Accounting Quarterly*, 13(1), 47-60.
- Martins, L. L., Gilson, L. L. & Maynard, M. T. (2004). Virtual Teams: what do we know and where do we go from here? *Journal of Management*, 30(6), 805-835. doi:10.1016/j.jm.2004.05.002
- Mielenterveyden keskusliitto (2018). *Resilienssi auttaa vastoinkäymisissä*. Available from: <http://mtkl.fi/resilienssi-auttaa-vastoin kaymisissa/>. Referred 2.8.2018
- Morgan, L., Paucar-Caceres, A. & Wright, G. (2014). Leading Effective Global Virtual Teams: The Consequences of Methods of Communication. *Systemic Practice and Action Research*, 27(6), 607-624. doi:10.1007/s11213-014-9315-2
- Morgeson, F., DeRue, D., & Karam, E. (2010). Leadership in teams: A functional approach to understanding leadership structures and processes. *Journal of Management*, 36(1), 5-39. doi:10.1177/0149206309347376

Newman, H. (2014). *Moving towards a recovery focused approach in a low secure forensic mental health setting: Staff perceptions and understanding of the impact of service change*. (PhD). Retrieved from Edinburgh Research Archive.

Nilsson, B. (2005). *Samspel i grupp*. Lund: Studentlitteratur

National Advisory Board on Research Ethics. (2009). *Ethical principles of research in the humanities and social and behavioural sciences and proposals for ethical review*. Available from: <http://www.tenk.fi>. Referred 26.10.2018

Norem, J. & Chang, E. (2002). The positive psychology of negative thinking. *Journal of Clinical Psychology*, 58(9), 993-1001.

Offerman, L.R. & Spiros, R.K. (2001). The science and practice of team development: Improving the link. *Academy of Management Journal*, 44(2), 376-392. doi: 10.2307/3069462

Ortiz de Guinea, A., Webster, J. & Staples, D.S. (2012). A meta-analysis of the consequences of virtualness on team functioning. *Information & Management*, 49(6), 301-308. doi: 10.1016/j.im.2012.08.003

Pliskin, N. (1997). The telecommuting paradox. *Information Technology & People*, 10(2), 164-172. doi:10.1108/09593849710175002

Ryan, M. R. (2010). Leadership. In Ubell, R. (Eds.), *Virtual teamwork. Mastering the Art and Practice of Online Learning and Corporate Collaboration*. (pp.17-43) New Jersey: John Wiley & Sons, Inc.

Salminen, J. (2017). *Onnistu tiimityössä. Tiimin jäsenen kirja*. Helsinki: J-Impact Oy.

Schreier, M. (2012). *Qualitative Content Analysis in Practice*. London: SAGE Publications Ltd.

Schweitzer, L. & Duxbury, L. (2010). Conceptualizing and measuring the virtuality of teams. *Information Systems Journal*, 20(3), 267-295. doi:10.1111/j.1365-2575.2009.00326.x

Seligman, M. E. P. (2008). *Aito onnellisuus: positiivisen psykologian keinoin täyteen elämään*. Helsinki: Art House Oy.

Siirtola, R., Palm, A. (2018). Yhdessä enemmän – Kriisien hallintaa kokonaisvaltaisesti. Helsinki: Laajan turvallisuuden verkosto WISE ry

Siklander, P. & Impiö, N. (2018). Common features of expertise in working life: implications for higher education. *Journal of Further and Higher Education*, doi:10.1080/0309877X.2018.1471126

Simons, H. (2009). *Case Study Research in Practice*. Los Angeles: SAGE.

Snellman, L. C. (2013). Virtual teams: opportunities and challenges for e-leaders. *Procedia – Social and Behavioral Sciences* 110, 1251-1261. doi:10.1016/j.sbspro.2013.12.972

Soon, S. & Prabhakaran S. G. (2018). An exploratory study on the qualities that enable Resilience in teams. *Civil Service College, Singapore*. Retrieved from <http://www.roffeypark.com/wp-content/uploads2/CSC-Team-Resilience-Exec-Summary.pdf>

Sudhakar, G. P. (2013). Different dimensions of teams. *Ecoforum*, 2(2). The ICFAI University. Retrieved from www.ecoforumjournal.ro/

Sue, V.M. & Ritter, L.A. (2007). *Conducting online surveys*. Los Angeles: Sage Publications, Inc.

Suomen mielenterveysseura (2018). *Mitä on resilienssi?* Available from: <https://www.mielenterveysseura.fi/fi/mielenterveys/vaikeat-el%C3%A4m%C3%A4ntilanteet/sairastuminen-voi-olla-kriisi/mit%C3%A4-resilienssi>. Referred 2.8.2018

Tuomi, J. & Sarajärvi, A. (2009). *Laadullinen tutkimus ja sisällönanalyysi*. (5th ed.) Helsinki: Kustannusosakeyhtiö Tammi.

Työterveyslaitos (2018). *Mitä on resilienssi?* Available from: <https://www.ttl.fi/tyoyhteiso/tyon-kehittaminen/mita-on-resilienssi/>. Referred 2.8.2018

Valli, R. & Perkkilä, P. (2018). Sähköinen kyselylomake ja sosiaalinen media aineistonkeruussa. In Valli, R. (Eds.) *Ikkunoita tutkimusmetodeihin 1. Metodien valinta ja aineistonkeruu: virikkeitä aloittelevalle tutkijalle*. (5th ed., pp.117-128) Jyväskylä: PS-kustannus.

Vera, M., Rodríguez-Sánchez, A.M. & Salanova, M. (2017). May the force be with you: Looking for resources that build team resilience. *Journal of Workplace Behavioral Health*, 32(2), 119-138, doi:10.1080/15555240.2017.1329629

Xie, Y., Xue, W., Li, L., Wang, A., Chen, Y., Zheng, Q, Wanq, Y. & Li, X. (2018). Leadership style and innovation atmosphere in enterprises: An empirical study. *Technological Forecasting and Social Change*, 135, 257-265. doi:10.1016/j.techfore.2018.05.017

Yin, R.K. (2009). *Case Study Research. Design and Methods*. 4th ed. Thousand Oaks, CA: Sage.

APPENDIX A

Virtual Team Leading and Team Resilience

Hi! Thank you for your interest in participating our study. We are graduate students of the Faculty of Education at University of Oulu, Finland, and with this survey we want to find out how virtual team leading performs in reality, and how virtual team's resilience is built. Resilience refers to a capacity to overcome tough/hectic situations even stronger than before, which leads to smoother actions in possible future adversity.

You will be asked questions about several things linked to resilience and some general questions about practices in working with a virtual team whom some or all team members work remotely and cannot collaborate in realtime or face to face all the time. Our target audience involves people who lead virtual teams and use communication technology to coordinate teamwork and to collaborate with team members - that's why you are a perfect fit!

Participating in this study will help us to identify how it is to lead a virtual team as well as which are the factors that enhance resilience. The survey should take about 15 minutes to complete. Your responses will remain strictly confidential and anonymous. The results of this survey are important for the development of effective leading of virtual teams and for identifying factors linked to resilience.

We want to thank you for every second invested in our research! Please click 'Next' to begin.

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***Required**

Skip to question 1.

Background information

If you work with several virtual teams, please choose the one you work the most with.

1.

1. Role in the company *

2.

2. Which country do you work in? *

Mark only one oval.

- ☐ United States
- ☐ Finland
- ☐ Sweden
- ☐ Norway
- ☐ Other: _____

3.

3. How many of your subordinates are working in a virtual team? *

Mark only one oval.

- ☐ 0 - 5
- ☐ 5 - 10
- ☐ 10 - 15
- ☐ 15 - 20
- ☐ 20+

4.

4. My team consist of (you can choose many) *

Tick all that apply.

- ☐ members from different nationalities
- ☐ members from same country
- ☐ members with different types of expertise
- ☐ members with same type of expertise
- ☐ Other: _____

Skip to question 5.

General Questions: Working with Virtual Team

5.

1. Is the same team used multiple times or do the members change per project? *

Mark only one oval.

- ☐ Multiple
- ☐ Change per project
- ☐ Other: _____

6.

2. What kind of roles do your team members have? *

7.

3. Have the members ever met face-to-face? *

Mark only one oval.

- ☐ Never
- ☐ Once, in the beginning of the project
- ☐ Once
- ☐ Rarely
- ☐ Occasionally
- ☐ Often
- ☐ Other: _____

8.

4. What technologies do you use to communicate with team members, how often (e.g. Skype, Google Drive)? *

9.

5. How does your virtual team deal with problems? *

Mark only one oval.

- ☐ Dealing with it from beginning to end: contains problem definition and problem solving
- ☐ Dealing with it in the beginning, by defining what the problem is
- ☐ Dealing with it at the end, by solving the problem
- ☐ Other: _____

Skip to question 10.

Team Resilience

We now ask you questions about resilience in your team. You don't need to remember the definition as exact, but it is written underneath to make it easier to understand. You can continue to answer without returning to this definition.

Resilience is a wide term, which in short describes the capacity to recover and learn from

stressful or hectic situations. It's not the same as persistence - resilience contains a thought about overcoming imbalance situations and learning from it, so it is easier to deal with same kind of adversity in the future. So to say, it's about development DURING tough or otherwise hectic situations. Resilience in a team requires, among other things, trust, communication, problem solving capacity, optimism, flexibility, and social skills.

10.

1. What are the most stressful factors for a virtual team in this organization? *

11.

2. How do you prepare for possible future stressful situations with your team? *

12.

3. What kind of strategies do you use with your team under stressful situations? *

13.

4. How do you analyze stressful/hectic situations afterwards with your team? *

14.

5. What did your team learn from its latest success? *

15.

6. What did your team learn from its latest misfortune? *

APPENDIX B

Etätiimin johtaminen ja tiimin resilienssi

Hei! Kiitos mielenkiinnostanne tutkimustamme kohtaan. Olemme maisteriopiskelijoita Oulun yliopiston kasvatustieteiden tiedekunnasta ja tämän kyselyn avulla haluamme selvittää, kuinka etätiimin johtaminen toimii käytännössä sekä miten tiimin resilienssi rakentuu. Resilienssi tarkoittaa kykyä päästä yli stressaavista/hektisistä tilanteista, jonka myötä tulevaisuuden vastoinkäymiset on mahdollista kohdata entistä vahvempina.

Kysely koostuu resilienssiaiheisista ja yleisistä kysymyksistä liittyen virtuaalitiimin kanssa työskentelyyn ja sen käytäntöihin, kun kaikki tai osa tiimin jäsenistä työskentelevät etänä eivätkä näin voi työskennellä toistensa kanssa koko aikaa reaaliaikaisesti tai kasvotusten. Tutkimuksen kohdejoukkona ovat etätiimejä johtavat henkilöt, jotka koordinoivat tiimityötä ja kommunikoivat tiimin jäsenten kanssa viestintäteknologiaa hyväksikäyttäen - siksi haluamme kuulla myös teitä!

Osallistumalla tähän tutkimukseen autatte meitä tunnistamaan millaista on johtaa etätiimiä sekä mitkä ovat ne tekijät, jotka lisäävät resilienssiä. Kyselyyn vastaaminen kestää noin 15 minuuttia. Vastaukset käsitellään luottamuksellisesti ja vastaaminen tapahtuu anonyymisti. Kyselyn tuloksia voidaan hyödyntää virtuaalitiimien johtamisen tehokkuuden kehittämisessä sekä resilienssiin vaikuttavien tekijöiden tunnistamisessa.

Kiitos vielä mielenkiinnostanne! Aloittaaksesi kyselyn, paina 'Seuraava'.

Yhteystiedot:

Oppimisen ja koulutusteknologian tutkimusyksikkö (LET), Kasvatustieteiden tiedekunta,
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***Required**

Skip to question 1.

Taustatiedot

Mikäli työskentelet useamman virtuaalitiimin kanssa, valitse niistä se, jonka kanssa työskentelet eniten.

1.
1. Rooli organisaatiossa *

2.

2. Missä maassa työskentelet?

Mark only one oval.

- ☐ Suomi
- ☐ Ruotsi
- ☐ Norja
- ☐ Yhdysvallat
- ☐ Other: _____

3.

3. Kuinka moni alaisistanne työskentelee etätiimissä? *

Mark only one oval.

- ☐ 0 - 5
- ☐ 5 - 10
- ☐ 10 - 15
- ☐ 15 - 20
- ☐ 20+

4.

4. Tiimini koostuu (voit valita useamman) *

Tick all that apply.

- ☐ useista kansallisuuksista
- ☐ yhden maan kansallisista
- ☐ eri alojen asiantuntijoista
- ☐ saman alan asiantuntijoista
- ☐ Other: _____

Skip to question 5.

Yleiset kysymykset: työskentely etätiimin kanssa

5.

1. Käytetäänkö samaa tiimiä useaan kertaan vai vaihtuvatko jäsenet eri projekteja varten? *

Mark only one oval.

- ☐ Useasti
- ☐ Vaihtuvat projektin mukaan
- ☐ Other: _____

6.

2. Millaisia rooleja tiiminjäsenillänne on? *

7.

3. Ovatko jäsenet koskaan tavanneet kasvokkain? *

Mark only one oval.

- ☐ Ei koskaan
- ☐ Kerran, projektin alussa
- ☐ Kerran
- ☐ Harvoin
- ☐ Toisinaan
- ☐ Usein
- ☐ Other: _____

8.

4. Mitä teknologiaa hyödynnät tiimin jäsenten kanssa kommunikoidessa, kuinka usein (esim. Skype, Google Drive)? *

9.

5. Kuinka virtuaalitiiminne käsittelevät ongelmia? *

Mark only one oval.

- ☐ Ongelman käsittely alusta loppuun: ongelman määrittely ja ongelman ratkaiseminen
- ☐ Ongelman käsittely alussa: ongelman määrittely
- ☐ Ongelman käsittely lopussa: ongelman ratkaisu
- ☐ Other: _____

Skip to question 10.

Tiimin resilienssi

Tässä osiossa kysymme teiltä kysymyksiä tiimin resilienssiin liittyen. Teidän ei tarvitse muistaa tarkkaa resilienssin määritelmää, mutta kirjoitimme sen tähän alle helpottamaan sen ymmärtämistä. Voitte jatkaa vastaamista palaamatta tähän määritelmään.

Resilienssi on laaja termi, joka lyhykäisyydessään kuvaa kykyä toipua ja oppia

stressaavista tai hektisistä tilanteista. Myös positiivista stressiä aiheuttavat tilanteet vaativat kykyä vastata muutokseen. Se ei ole sama asia kuin sinnikkyys - resilienssi sisältää ajatuksen haastavien tilanteiden voittamisesta ja niistä oppimisesta, mikä helpottaa samankaltaisten tilanteiden käsittelemistä tulevaisuudessa. Se on siis kehittymistä JO vaikeiden tilanteiden aikana. Resilienssin rakennuspalikoita tiimissä ovat mm. luottamus, kommunikaatio, ongelmanratkaisukyky, optimismi, joustavuus sekä sosiaaliset taidot.

10.

1. Mitkä ovat kaikista stressaavimpia tekijöitä etätiimillenne tässä organisaatiossa? *

11.

2. Miten varaudutte tiiminne kanssa tulevaisuuden mahdollisiin stressaaviin tapahtumiin? *

12.

3. Minkälaisia strategioita käytätte tiiminne kanssa stressaavien tilanteiden alla? *

13.

4. Miten analysoitte stressaavia/hektisiä tilanteita jälkikäteen tiiminne kanssa? *

14.

5. Mitä tiimisi oppi viimeisimmästä onnistumisestaan? *

15.

6. Mitä tiimisi oppi viimeisimmästä epäonnistumisestaan? *

APPENDIX C

Virtuell teamledning och team resiliens

Hej! Tack för att du visar intresse för vår undersökning. Vi studerar i utbildningsvetenskapliga fakulteten i Uleåborgs universitet, Finland, och med denna undersökning vill vi reda ut hur virtuell teamledning framträder i verkligheten och hur resiliens uppbyggs i virtuella team. Resiliens betyder förmåga att överkomma stressande/hektiska situationer starkare än förr. Detta leder till smidigare förhandlingar under framtida motgångar.

En del av frågorna är direkt kopplade till resiliens och en del kartlägger hur virtuella team, vars medlemmar inte kan hela tiden arbeta i realtid och ansikte mot ansikte, arbetar i praktiken. Vår målgrupp är teamledare som måste använda kommunikationsteknologi för att kunna koordinera teamarbete och för att samverka med sina teammedlemmar - därför är ni perfekt för oss!

Undersökningen hjälper oss att identifiera hur det är att leda ett virtuellt team och vilka faktorer det är som ökar resiliens. Undersökningen tar ca 15 minuter. Svaren bevaras konfidentiellt och anonymt. Resultaten kommer att vara viktiga för utveckling av effektiv virtuell teamledning och för att kunna identifiera de faktorer som är länkade till resiliens.

Vi vill tacka för varje sekund som läggs ner på vår undersökning! Vänligen tryck 'Nästa' för att börja.

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***Required**

Skip to question 1.

Bakgrundsinformation

Om du arbetar med flera virtuella team, välj den som du arbetar mest med.

1.

1. Position i företaget *

2.

2. Vilket land arbetar du i? *

Mark only one oval.

- ☐ Sverige
- ☐ Norge
- ☐ Finland
- ☐ United States
- ☐ Other: _____

3.

3. Hur många av dina anställda arbetar i virtuellt team? *

Mark only one oval.

- ☐ 0 - 5
- ☐ 5 - 10
- ☐ 10 - 15
- ☐ 15 - 20
- ☐ 20+

4.

4. Mitt team består av (du kan välja flera) *

Tick all that apply.

- ☐ medlemmar med olika nationaliteter
- ☐ medlemmar med samma nationalitet
- ☐ medlemmar med olika slags expertis
- ☐ medlemmar med samma slags expertis
- ☐ Other: _____

Skip to question 5.

Allmänna frågor: Att arbeta med virtuella team

5.

1. Används samma team flera gånger eller byts medlemmarna enligt projekt? *

Mark only one oval.

- ☐ Flera gånger
- ☐ Byts enligt projekt
- ☐ Other: _____

6.

2. Hurdana roller har dina teammedlemmar? *

7.

3. Har teammedlemmarna träffat nånsin varandra ansikte mot ansikte? *

Mark only one oval.

- ☐ Aldrig
- ☐ En gång, i början av projektet
- ☐ En gång
- ☐ Sällan
- ☐ Ibland
- ☐ Ofta
- ☐ Other: _____

8.

4. Vilka teknologiska redskap använder du för att kommunicera med teammedlemmarna, hur ofta (t.ex. Skype, Google Drive)? *

9.

5. Hur hanterar ditt virtuella team problem? *

Mark only one oval.

- ☐ Hantering från början till slut: innehåller både problem definiering och problemlösning
- ☐ Hantering i början, definiering av problemet
- ☐ Hantering i slutet, lösning av problemet
- ☐ Other: _____

Skip to question 10.

Team resilience

Vi frågar nu om resiliens i ditt team. Du behöver inte komma ihåg exakta definitionen av resiliens, men den är förklarad nedan för att underlätta förståelsen av ordet. Du kan fortsätta utan att återkomma till definitionen.

Resiliens betyder kort sagt kapacitet att återhämta och lära sig från stressande eller

hektiska situationer. Det är inte samma som uthållighet - resiliens innehåller en tanke om att överkomma obalanserade situationer och lära sig från det, så det är lättare att hantera liknande motgångar i framtiden. Så att säga, det handlar om utveckling UNDER tuffa eller annars hektiska situationer. Resiliens i ett team kräver bland annat tillit, kommunikation, förmåga att lösa problem, optimism, flexibilitet och sociala talanger.

10.

1. Vilka faktorer är mest stressande för virtuella team i er organisation? *

11.

2. Hur förbereder du och ditt team er för möjligen kommande stressfulla situationer? *

12.

3. Vilka strategier använder ni med teamet under stressfulla situationer? *

13.

4. Hur analyserar ni stressfulla/hektiska situationer efteråt med teamet? *

14.

5. Vad lärde ni er av teams senaste succé? *

15.

6. Vad lärde ni er av teams senaste motgång? *
